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VOL. LIV.

PART I. (HISTORY, ANTIQUITIES, &c.)

(NOS. I TO IV.—1885: with 7 plates.)

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THE PHILOLOGICAL SECRETARY.

> "It will flourish, if naturalists, chemists, antiquaries, philologers, and men of science in different parts of *Asia*, will commit their observations to writing, and send them to the Asiatic Society at Calcutta. It will languish, if such communications shall be long intermitted; and it will die away, if they shall entirely cease."
>
> SIR WM. JONES.

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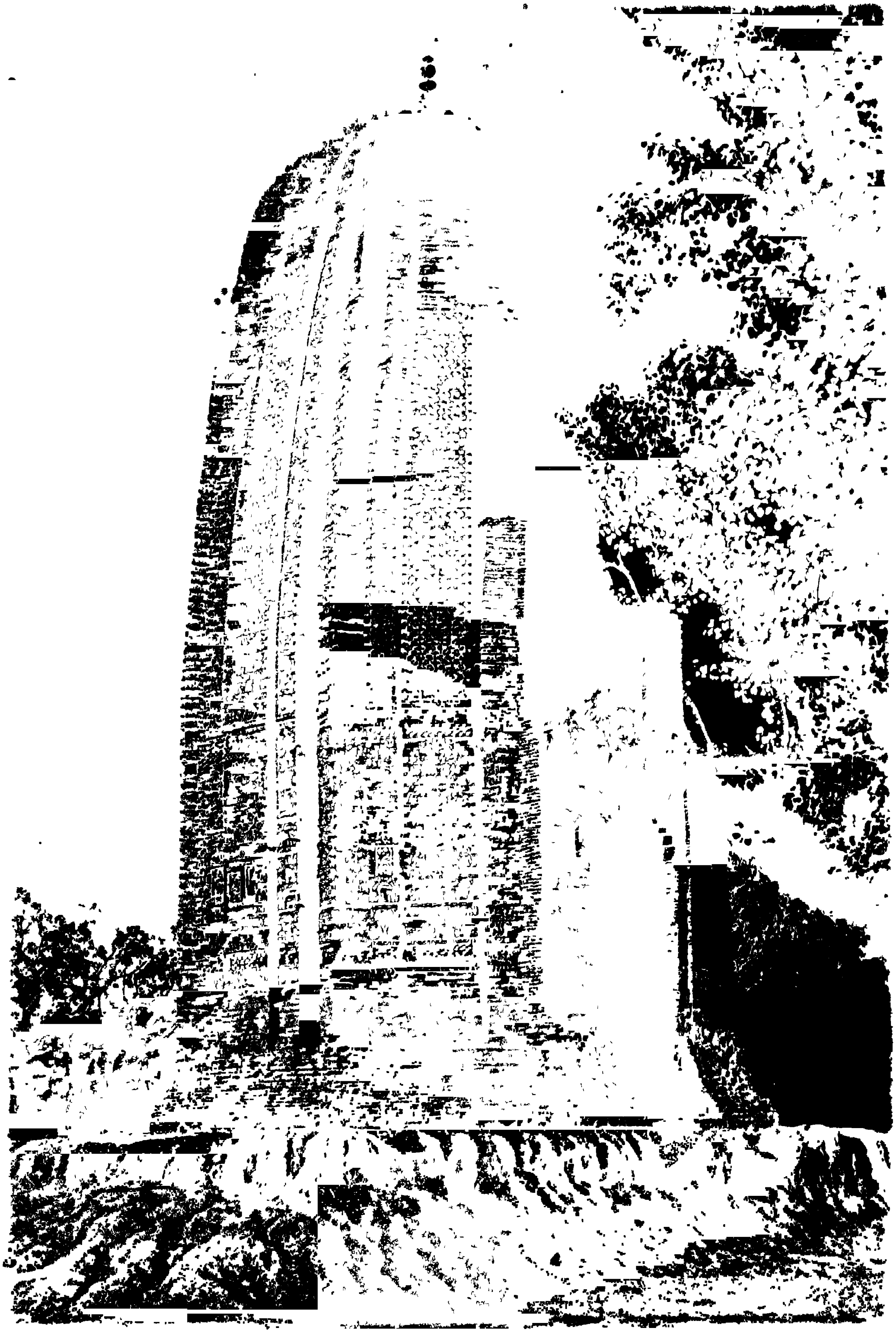

From a photograph by A. Baldwin

TEMPLE AT TINDULI, FATEHPUR DISTRICT, N. W. P.

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Part I.—HISTORY, LITERATURE, &c.

No. I.—1885.

Notes on the history of Religion in the Himálaya of the N. W. Provinces.

Part I.—By E. T. Atkinson, B. A., F. R. G. S., B. C. S.

(Concluded from page 103, *No.* 1 *of* 1884.)

Funeral Ceremonies.

The ceremonies to be observed at funerals are found in the *Preta-manjarí*, the authority on this subject which obtains in Kumaon. This work opens with the direction that when a person is *in extremis* his purohita should cause him to repeat the hymn to Vásudeva and the *smaraṇa* in which the names of Ráma and S'iva occur, and after these make the *daśadána* or bestowal of ten things in accordance with the *sútra*[*] :—'The learned have said that cattle, land, sesamum, gold, clarified butter, apparel, rice, molasses, silver and salt are included in the ten gifts.' In bestowing the *daśadána*, the sick man or in his stead the *purohita* first rinses his mouth and consecrates the *argha* and then repeats the *práṇáyáma* as already described. The meditation or *dhyána* appropriate is that known as the *Sríparameśvarasmṛita* or meditation on the Supreme being as distinguished from and above his particular manifestations as S'iva and Vishṇu. This is followed by the *sankalpa* or dedication of the gifts with the same mantra as used in the Ganeśa-*pújá* (*Om Vishṇu*, &c.), ending with the prayers that there may be a removal of all sins committed wittingly or unwittingly by the dying man during his life-time and that he may obtain the fruit of his good acts. For this purpose on the part of the moribund each of the gifts and the Bráhmans concerned are reverenced, and the gifts are then presented.

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[*] *Go-bhú-tila-hiraṇyájya-vásodhánya-guḍáni cha raupyam lavanam ity áhur daśa-dánáni paṇḍitáḥ.*

Kapilá-dána.—First the *kapiládána* or a gift of a cow of a yellowish-brown colour with the five *mantras*[*] beginning with :—*Idaṃ vishṇur vichakrame tredhá nidadhe padaṃ samúḍham asya páṃsure* and in practice this alone is recited. Then the *argha* is presented to the Bráhman with a *mantra*[†] praying him as best of men to be present at the sacrifice and accept the *argha*. Then sandal-wood is given with a *mantra*[‡] and rice with another *mantra*.[§] Flowers are then presented with the *mantra* :—'Glory to thee, O Bráhman.' Next the cow should receive veneration with the appropriate *mantra* :—'Glory to thee O Kapilá,' and each of its members, the fore-feet, mouth, horns, shoulder, back, hind-feet and tail with a salutation and the gift of sandal, rice and flowers. A covering is then presented with food, incense, light, and the installation hymn :—*Yá Lakshmíḥ sarvvalokánáṃ*, &c. Then the moribund takes sesamum, *kuśa*-grass, barley, and gold in a pot of clarified butter and with them the cow's tail in his hand over which water is poured, and all are dedicated to the removal of the guilt of his sins and for this purpose are given to so and so Bráhman in the name of Rudra. The cow is first addressed, however, with the mantra :—*Kapile sarvva-varṇánáṃ*, &c. The cow and Bráhman then circumambulate the moribund, who with clasped hands repeats a verse[||] in praise of the cow.

Bhúmi-dána.—Next comes the *Bhúmi-dána* or gift of land. The installation hymn (*prárthana*) beginning :—*Sarvvabhútáśrayá bhúmiḥ, &c.*, is first addressed to the earth. Then a ball of clay is made from the soil of the land which is intended to be given away and is worshipped and dedicated as in the previous gift and then after consecration, is given away for Vásudeva's sake to the Bráhman. The *Tila-dána* or gift of sesamum follows with the mantra :—*Tiláḥ suvarṇa-samáyuktáḥ*, &c., and the usual consecration and dedication in the name of Vishṇu and the hymn of praise :—*Tiláḥ pápahará nityaṃ, &c.*

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[*] These mantras are practically unknown to the mass of the people who have much simpler ritual feebly on the same lines.

[†] *Bhúmidevágrajanmási twaṃ viprapurushottamapratyaksho yajña-purushaḥ argho'yaṃ pratigrihyatám.*

[‡] *Gándhadwáráṃ durádharsháṃ nityapushṭáṃ karishiním iswaríṃ sarvabhútánáṃ tám ihopahvaye śriyam.*

[§] *Namo brahmaṇyadeváya gobráhmaṇahitáya cha jagaddhitáya Kṛishṇáya Govindáya namonamaḥ.*

[||] *Oṃ gávaḥ surabhayo nityaṃ gávo guggula-gandhikáh, &c.*

Next comes the *Hiraṇya-dána* or gift of gold with a mantra* :—and the usual dedication, &c., in the name of Agni. The *Ajyadána* or gift of clarified butter is next made with the mantra :—'Sprung from Kámadhenu, &c.,' and the dedication in the name of Mṛityunjaya. The procedure is the same all through, the *mantras* used alone being different For the *Vastra-dána* or gift of apparel we have the mantra :—'*Píta vastra*, &c.,' and the dedication in the name of Vṛihaspati. The *Dhányadána* or gift of rice of seven kinds has the mantra :—'*Dhányaṃ karoti dátáram*, &c.,' and is presented in the name of Prajápati. The *Guṛadána* or gift of molasses has the mantra :—'*Guḍa manmathachápottha*, &c.,' and is given in the name of Rudra. The *Raupya-dána* or gift of silver has the mantra :—'*Rudranetra-samudbhútam*, &c.,' and is offered for the sake of Soma, the moon, with the prayer that any laxity in morals may be forgiven. The *Lavaṇa-dána* or gift of salt follows with the mantra :—'*Yasmád annarasáḥ sarve*, &c., and is presented on behalf of all the gods

Last service for the dying.—The moribund next presents the fruit of all the ceremonial observances that he has undertaken during his life to plead on his behalf with Íśvara. He also dedicates sesamum, *kuśa*, barley and water and enumerates all the penance that he has performed during his life and commits it with an oblation to the mercy-seat' in the name of Agni to plead on his behalf. He then prays that for the sake of the good Vásudeva whatever errors he may have committed in ceremonial or other observances knowingly or in ignorance, in eating or drinking and in his conduct towards women or men may be forgiven, for which purpose he offers gold. A similar gift of a cow is sometimes made to clear off all debts due to friends and others, but the practice has fallen into disuse, as the heir, according to the usage of the British law-courts, must pay his father's debts if sufficient assets fall into his hands.

Vaitaraṇí-dána.—Another cow should be presented in Govinda's name to prevent the retribution due on account of evil acts of the body, evil speech in words and evil thoughts in the heart, and again another cow in the hope of final liberation (*moksha-dána*) through the loving-kindness of Rudra and in his name. As a rule, however, but one cow is given, and this only in the *Vaitaraṇí-dána* which now takes place. For this rite a cow of a black colour is selected and worshipped as prescribed in the *Kapilá-dána*, and the gift is dedicated to help the spirit of the moribund after death in its passage across the Vaitaraṇí river, and with this object it is formally delivered over to a Bráhman. The installation verse for the cow is—'Glory to thee, O cow, be thou ready to assist at the very terrible door of Yama this person desirous to cross the Vaitaraṇí,' and for the river in the verse:—"Approaching the awful entrance to the realms of Yama and the dreadful Vaitaraṇí, I desire to give this black cow to thee, O Vaitaraṇí, of my own free-will so that I may cross thy flood flowing with pus and blood, I give this black cow." Selections from the *Bhagavad-gítá* are then read to the sick man and the thousand names of Vishṇu are recited. His feet and hands are bathed in water taken from the Ganges or some other sacred stream whilst the frontal mark is renewed and garlands of the sacred *tulsí* are thrown around his neck. The ground is plastered with cow-dung and the dying man is laid on it with his head to the north-east and if still able to understand, verses in praise of Vishṇu should be recited in a low, clear voice suited to the solemn occasion. The priestly instinct is even now alive and the family astrologer appears on the scene to claim another cow that the moribund may die easily and at an auspicious moment.

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* *Hiraṇyagarbha-garbhasthaṃ hemabíjaṃ vibhávasoḥ, ananta-puṇyaphaladam ataḥ śántiṃ prayachchha me.*

Preparing the body for the pyre.—When the breath has departed, the body of the deceased is washed with earth, water and the fruit of the *Emblica officinalis* and then anointed with clarified butter whilst the following mantra* is repeated:—"May the places of pilgrimage, Gayá and the rest, the holy summits of mountains, the sacred tract of Kurukshetra, the holy rivers Ganges, Jumná, Sárasvati, Kosí, Chandrabhága which removeth the stains of all sins, the Nandábhadra the river of Benares, the Gandak and Sarju as well as the Bhairava and Váráha places of pilgrimage and the Pindar river, as many place of pilgrimage as there are in the world, as well as the four oceans, enter into this matter used for the ablution of this body for its purification." The body is then adorned with *gopichandana*, the sacrificial thread, yellow clothes and garlands. Gold or clarified butter is then placed on the seven orifices of the face and the body is wrapped in a shroud and carried to the burning-ghát. The body is placed with its head to the east and the face upwards whilst the near male relatives are shaved. In the meantime *piṇḍas* or small balls of barley-flour and water are offered according to the rule:—*Mṛitistháne tathá dwáre viśrámeshu chitopari; kukshau piṇḍáḥ pradátavyáḥ pretapiṇḍáḥ prakírtitáḥ*—'Where the man dies, at the door (of his village), where the bearers rest, at the pyre upon his body, these (five) *piṇḍas* should be offered by rule; these are well known as the *pretapiṇḍa*. Each *piṇḍa* should have its proper dedication with definition of time, place, and person (*mṛitisthána, dwára, &c.*) First some water is thrown on the ground with a dedication, and then the piṇḍa is taken in the hand and after the recital of the dedication, it, too, is thrown on the ground and again water is sprinkled on the same place with a third dedication. This is repeated at each of the five places. The wood of sandal, cedar, *bel*, or *dhák*, mixed with ghí, are laid on the body, which is placed on the pyre with the head to the south. The son, or nearest male relative, bathes and dedicates the rite to the release of the soul of the deceased from the company and region of sprites and its exaltation to the heaven of the good, after which the *kukshi-piṇḍa* is offered.

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* *Gayádíni cha tírtháni ye cha puṇyáḥ śilochchayáḥ; kurukshetram̱ cha gangá cha yamuná cha sarasvatí, kauśikí chandra-bhágá cha sarvapápapranáśiní, nandá bhadrá cha káshi cha gaṇḍakí sarayú tathá, bhairavam̱ cha váráham̱ cha tírtham̱ piṇḍarakam̱ tathá, prithivyám̱ yáni tírtháni chatwáraḥ ságarás tathá, śavasyásya viśuddhyártham̱ asmin toye viśantu vai.*

Office for cremation.—The fire is next applied by the nearest male relative to the wood at the foot of the corpse, if the deceased be a female, and to the wood at the head, if a male, with the *mantra*:—" *Oṃ* mayest thou arrive at the blissful abodes, thou with thy deeds whether done ill purposely or unwittingly hast become an inhabitant of another world, thy body encompassed with its load of desire and ignorance, weighted with its deeds of right and wrong has been completely resolved into its five elements." Then comes the *Tilamiśra-ájyáhuti* or *homa* with sesamum mingled with clarified butter accompanied by the mantras:—*Oṃ lomabhyaḥ sváhá, oṃ twache sváhá, oṃ lohitáya sváhá, oṃ máṃsebhyaḥ sváhá, oṃ medobhyaḥ svaha, oṃ tvagbhyaḥ sváhá, oṃ majjábhyaḥ sváhá, oṃ retase sváhá, oṃ roditebhyaḥ sváhá.*—'Hail salutation to the hair, epidermis, blood, marrow, skin, the essential element of the body, the semen, and to him who is bewailed.' Then follows the *sútra* directing the circumambulation of the pyre whilst sesamum* is sprinkled over the burning body with the *mantra*:—' *Oṃ*, glory to the fire of the funeral pyre.' When the body has been almost entirely consumed, a small portion of the flesh, about the size of a pigeon's egg, should be taken and tied up in a piece of cloth, and flung into a deep pool. Then the person who conducted the ceremony puts out the fire and bathes, anointing himself with the *pancha-gavya* and places a seat of *kuśa*-grass for the spirit of the deceased with a dedication followed by water, a *piṇḍa* and again water, each accompanied by its proper dedication.

Bali-dána.—Next the *bali-dána*, consisting of rice, sandal, &c., is offered to the goblins and sprites of the burning-ghâṭ with the prayer that they will accept it, eat it and be appeased. Whoever wishes to preserve a portion of the bones, to cast them into the sacred stream of the

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[*] The rich throw sandal, *tulsí*, sesamum and clarified butter on the pyre whilst the relatives cry out with a loud voice so as to attract the notice of the dweller in paradise.

Ganges at Hardwár (*phúl syavauna*), will collect them between his thumb and little finger and wash them in the *panchagavya* and clarified butte and placing them in a cloth bury them for a year before he attempts to carry out his purpose. All ceremonies performed for an ancestor must be carried through with the sacrificial thread over the right shoulder, all worship of the gods with the thread as usual over the left shoulder. The pyre is then cleaned and smeared with cow-dung whilst the dedication is made and water and a *piṇḍa* are given followed by water as before. Then the *mantra* is recited:—*Anádinidhano deva śankha-chakra-gadádhara; akshayaḥ puṇḍaríkáksha preta-moksha-prado bhava.*—An address to the deity praying for the liberation of the soul of the deceased. A Bráhman repeats the *mantra* with his face towards the south; a Kshatriya looking towards the north; a Vaiśya to the east and a S'udra to the west, whilst the knot of the hair on the top of the head is unloosed. The sacrificial thread is then replaced and the *áchamanas* made. The thread is again put on the right shoulder (*apasavya*) whilst water is offered in the hollow of both hands to the manes of the deceased. The person who performs the rites bathes again before returning home and fasts for the rest of the day.

Ceremonies after cremation.—Lamps are kept lighting for the benefit of the manes for ten days after cremation either in a temple or under a *pípal* tree or where the obsequial ceremonies are performed, according to the rule:—*Tiláḥ pradeyáḥ páníyaṃ dipo deyaḥ śiválaye, jñátibhiḥ saha bhoktavyam, etat pretasya durlabham.*—Sesamum, water and lights should be provided in a temple of S'iva and meals should be taken with the relatives—for this has (now) become difficult to be obtained by a sprite. The place where the obsequial ceremonies (*kiriyá-karma*) subsequent to cremation take place is called the *ghát* or *bugra*. It is chosen, as a rule, near running water, but must not lie to the west of the house where the person for whom the rite is performed died. On the day following the cremation, the person who performed the principal part at the funeral pyre proceeds to the *ghát* and selecting a place, clears it and plasters it with mud and cow-dung. A fire-place is then built towards the northern part and on one side, an altar of white clay smeared with cow-dung. The lamp is next lighted with the dedication to enlightening the manes now in darkness so as to alleviate its sufferings. Then with top-knot unloosed the celebrant bathes on behalf of the manes with the usual definition, of place, time, person and object which is the performance of the ceremonies of the first day.

Tilatoyánjali.—Next the top-knot is tied up and the mouth is rinsed, after which he takes sesamum, water, *kuśa*-grass and barley and with his face towards the south offers them in the palms of both hands on behalf of the manes with the usual dedication. The object declared is to allay the extremes of heat and thirst which the spirit must undergo and to perform the rites of the first day on its behalf. The ceremony known as the *tilatoyánjali* must be performed either thrice or once each day for the next ten days. Then rice* is boiled in a copper vessel and in it sesamum, *nágakeśara* (*Mesua ferrea*), honey and milk are placed and afterwards made into balls about the size of a *bel* fruit; these are offered with a dedication in the name of the deceased and the object that the spirit should obtain liberation and reach the abodes of the blessed after crossing the hell called *Raurava* and also that the head of the new body of the spirit may be formed correctly. Before actually offering the *piṇḍa*, the celebrant should stand in silence to the left of the fire-place, and place a *pavitra*† on the ground and on it a *karma-pátra* or sacrificial vessel and on the latter again a *pavitra*. The vessel should then be filled with water, sesamum and perfumes whilst the altar is covered with *kuśa*-grass. The celebrant next takes a *pavitra* and water in his hand and repeats the dedication as to laying the *kuśa* on the altar in the name of so and so deceased as a seat for his spirit. After this, water (*avánejana*) is poured on the altar with a similar dedication and then the *piṇḍa* is offered whilst the celebrant drops on his left knee and repeats the dedication already given. As already noticed, the object of the *piṇḍa* presented on the first day is to enable the spirit to cross the hell called Raurava and have a head for its new body. This is followed by an offering of water, one of very cold water, and one of sandal, rice, *bhinga-rája*‡ (*Eclipta prostrata*), flowers, incense, lamps and balls of rice and honey, each with its own proper dedication in the name of the manes. The thirteenth dedication is concerned with the consecration of the *karma-pátra* already mentioned. On the first day one *piṇḍa* is offered: on the second, two *piṇḍas*, &c., so that in ten days, fifty-five *piṇḍas* are offered each with the same ceremony as here given. Then comes the prayer that the *piṇḍas* already given may reach the manes, and the *karma-pátra* is turned upside down. The mouth is then rinsed with the usual formula and all the materials are thrown into the water with the *mantra*:§—'Thou hast been burned in the fire of the pyre and hast become separate from thy brethren, bathe in this water and drink this milk thou that dwellest in the ether without stay or support, troubled by storms and malignant spirits, bathe and drink here and having done so be happy.'

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* Kshatriyas and all other than Bráhmans make the *piṇḍas* of barley-flour and also the illegitimate children of Bráhmans.

† See before.

‡ In Kumaon the *Cinnamomum Tamala* or *tejpát* is used.

§ *Chitánala, pradagdho'si parityakto'si bándhavaiḥ; idaṃ níram idaṃ kshíram atra snáhi idaṃ piba; dkáśastho nirálambo váyubhútaḥ samárditaḥ, atra snátvá idaṃ pítvá snátvá pítvá sukhí bhava.*

To the south of the fire-place a small earthen vessel known as a *karuwá* is filled with water in which *kuśa*, sesamum, barley and milk are placed and suspended from a tree, or if there be no tree, from a stake fixed in the ground with a tooth-brush of *ním* (*Melia indica*). Then bathing and putting on clean clothes, the celebrant returns home and when eating puts a portion of the food on a leaf-platter and leaves it with water either where four roads meet or on that side of the village which is nearest to the burning-ghát, both places being the favourite resorts of disembodied spirits. This portion called the *preta-grása* or spirits' mouthful is offered with the usual dedication to the name of the deceased.

Ceremonies of the first ten days.—The proceedings of each day are the same, the only difference being the object of the *piṇḍa.* The following list of the hells crossed before reaching paradise and the different parts of the new body of the spirit affected by each day's ceremony will suffice :—

Day.	**Hell met with.*	*Portions of the new body formed.*
First	Raurava	Head.
Second	Yonipuṃsaka	Eyes, ears and nose.
Third	Mahárauravа	Arms, chest, neck and members of the mouth.
Fourth	Támisra	Pubic region, penis, void and parts around.
Fifth	Andhatámisra	Thighs and legs.
Sixth	Sambhrama	Feet and toes.
Seventh	Amedhya-krimi-pûrṇa	Bones, marrow and brain.
Eighth	Purísha bhakshaṇa	Nails and hair.
Ninth	Svamáṃsa bhakshaṇa	Testes and semen.
Tenth	Kumbhípáka	To avoid the wants of the senses.

Tenth day.—The new body having been formed the natural wants of a living body are presupposed and the ceremony of the tenth day is devoted to removing the sensation of hunger, thirst, &c., from the new body. On the same day the clothes of the celebrant are steeped in cow's urine with soapnuts and washed, the walls of the house are plastered, all metal vessels are thoroughly cleaned, the fire-place at the ghâṭ is broken and an *anjali* of water is offered to the ether for the sake of the manes and to assuage its thirst. The celebrant then moves up the stream above the *ghâṭ* and with his near relatives shaves and bathes and all present an *anjali* of water as before. Bathing again all proceed homewards,† having been sprinkled with the *pancha-gavya*. The following rule lays down the period necessary for purification:—*Bráhmaṇo daśarátreṇa dwádaśáhena bhúmipaḥ; vaiśyaḥ panchadaśáhena śúdro másena śudhyati.* "The Bráhman becomes pure in ten days, the Kshatriya in twelve days, the Vaiśya in fifteen days and the Sudra in a month".

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* Most of the names of hell occur in the law-books or the Puráṇas. The first, third, fourth and fifth in Manu, IV. 88: the tenth in the Bhágavata-puráṇa, and the remainder in the Skanda-puráṇa.

† It is the custom to offer one more *piṇḍa* on the road homewards called the *pátheyaśráddha*, but this is usually made of uncooked flour and water.

Ceremonies of the eleventh day.—After the usual domestic prayers, on the eleventh day the figures of Lakshmí and Náráyaṇa are worshipped and a covering spread for them on the chárpái of the deceased and a cow offered in his name as *kapilá-dána.* Next vessels of water (*Udaka-kumbha*) are filled and food prepared in the name of the deceased. A bullock is also branded on the flanks with the trident and discus and struck three times with the hand and then let go,* followed by the *ekádaśáha śráddha.* The palm of the hand represents three *tírthas:* the *Brahma-tírtha* is the hollow at the wrist through which the rinsing of the mouth is effected; the *Deva-tírtha* is between the fingers sloping downwards and is used in offering water to the gods, and the *Pitṛi-tírtha* is the hollow between the thumb and first finger through which the water flows when offered to ancestors. For instance, in the worship of Lakshmi-Náráyaṇa, the water is presented through the *Deva-tírtha.* First the covering is placed on the chárpái and on it the images with a dedication to the sure admission into paradise of the manes, and for this purpose the figures of the deities Lakshmí and Náráyaṇa are worshipped. The installation hymn to the deities then follows and offerings of rice, water, sandal, flowers, incense, lamps and wearing apparel are made. To this succeeds the *dhyána* or meditation in honour of Vishṇu, who has in his right hand the lotus, in his left the conch, &c.; then come appropriate gifts, according to the ability of the donor, which eventually become the property of a Bráhman with the prayer that as S'iva and Kṛishṇa live in happiness and comfort, so may the deceased abide, and for this purpose all these good things have been provided. The *purohita* then lies down on the couch for a short time and so sanctifies the gifts that have been made whilst the verse is read:—*Yasya smṛityá cha nánoktya tapoyajṇakriyádishu nyúnaṃ sampúrṇatáṃ yáti sadyo vande tam achyutam.*—'That Achyuta through whose remembrance and invocation the shortcomings of my religious observances are supplemented, Him do I now adore.'

Gifts of a cow.—Next comes the *kapilá-dána* as before with the dedication:—'O Kapilá worshipped of all the four castes, best, containing all places of pilgrimages and deities alleviate my trouble.' The water vessels are next presented and there should be one for every day in the year and each should be accompanied by food and lights for the same period for the benefit of the spirit of the deceased† and then given to Bráhmans with the verse:—'*Yasya*, &c.,' as in the preceding pargraph.

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* As a rule, however, this is a mere form and the irons are not heated.

† As a rule the poor can only afford one.

The scape-bullock.—The loosing of the scape-bullock (*vṛishotsarga*) is seldom observed in Kumaon, though the ritual for it is given. First an altar is erected of earth and the fire is lighted thereon and Agni is installed and worshipped. The altar is then dedicated to the rite of the *pradhána-homa*. This homa is begun by throwing clarified butter into the fire with the mantra:—*Oṃ iha ratis sváhá idaṃ agnaye, oṃ iha ramadhvaṃ sváhá idam agnaye, oṃ iha dhṛitis sváhá idam agnaye, oṃ svadhṛitis svâhâ idam agnaye, oṃ iha ramasva sváhá idam agnaye*; and again *Oṃ prajápataye, indráya, agnaye, somáya sváhá.* Next curdled milk is thrown on the fire and the eight gods are saluted:—Agni, Rudra, S'arva, Paśupati, Ugra, I'śána, Bhava, and Mahádeva, all old names. Then comes the *Paushṇacharu-homa* or oblation of rice barley and pulse boiled in milk and clarified butter and presented with the mantra:—*Oṃ púsháyá anvetu naḥ púshá rakshasva sarvataḥ, púshá váján sanotu naḥ sváhá*; and again *Oṃ agnaye svishṭakṛite sváhá, oṃ bhú sváhá, oṃ bhuvaḥ sváhá, oṃ svaḥ sváhá.* In these *mantras* the ancient deities Púshan and Agni are invoked. A bell is then suspended from the neck of the bullock and small bells are tied round its feet, and it is told that it is to be let go in order to save the spirit of the deceased from the torments of hell. The following mantra is then whispered it its ear:—*Vishṇur hi bhagaván dharmaḥ chatushpádaḥ prakírtitaḥ, vṛiṇomi tam ahaṃ bhaktyá sa máṃ rakshatu sarvadá.* Then follows the verse:—'*Oṃ ṛitaṃ cha, &c.*,' as in the *sandhyá.* The bullock is addressed as the fourfooted representative of the Supreme and asked to preserve for ever his votary. The *bail-gáyatrí* is then recited:—*Om tíkshṇaśṛingáya vidmahe vedapáśáya dhímahi tan no vṛishabhaḥ prachodayát.* Sesamum, *kuśa*, barley and water are taken in the hand and also the bullock's tail, whilst water is poured over all with the mantra:*—'To fathers, mothers and relations both by the mother's and father's side, to the *purohita*, wife's relations and those who have died without rites and who have not had the subsequent obsequial ceremonies performed, may salvation arise by means of the unloosing of this bullock.' The bullock will then be loosed with a dedication. The right quarter is sometimes branded with a trident and the left with a discus and the animal becomes the property of some of the low-caste people in the village.

Ekádaśáha-śráddha.—The *ekádaśáha-śráddha* commences with a bathing and dedication to the first *śráddha* in honour of the deceased. Hitherto only the ceremonies known as *kiriya-karma* have been performed whilst the spirit of the deceased remained a *pret*, but now in order that he may be numbered amongst the *pitṛis* or ancestors, the formal *śráddha* is undertaken in his honour and for his benefit. Dry, clean clothes are worn and the celebrant proceeds to the *ghát* and rinses his mouth with the usual formula. Then rice is cooked and five small bundles of *kuśa* are washed and anointed with oil and set up to represent the Bráhman on the part of the deceased with the *nimantrana* or invitation :—*Gato'si divyaloke tvaṃ kritántavihitát pathaḥ, manasá váyubhútena vipre tváhaṃ nimantraye*—you have departed to be away having your way prepared by the god of death with a mind turned into wind. I would invite you. Similar bundles are consecrated to represent the spirit of the deceased and water and the *argha* are offered with the prayer that they may be accepted. In silence the *karmapátra* is placed on the ground and offerings of sandal, &c., made as before.* The dedication is then made for the purpose of performing the ceremony as if it were the *ekoddishṭa-śráddha*.† For this purpose a seat is placed and the *argha* is consecrated and dedicated to the spirit of the deceased. Gifts are then presented to both the symbolised Bráhman and *preta* and both are reverenced. A brázen platter is then smeared with clarified butter and the rice placed on it and dedicated to the acceptance of the spirit. A circular altar a span in diameter is next made and smeared with cow-dung. Rice is also mixed with milk, sesamum, clarified butter, and honey and made into round balls about the size of a *bel* fruit and with *kuśa*, sesamum and water are taken in the hand and dedicated to the first *śráddha*. The altar is covered with *kuśa* and on it a single *piṇḍa* is placed, then water, sandal, rice, flowers, incense, lamps, sweetmeats and woollen thread are each presented with a dedication as offerings to the spirit of the deceased. The bundles of *kuśa* which represent the Bráhman are then addressed and told that the preceding offerings have been made to the *preta* and to grant that they may be accepted and for this purpose water is offered to him. Gifts are then made to the symbolised Bráhman which are kept until the next day, as gifts made during the first eleven days cannot be accepted by a *purohita*. The water in the *karm-pátra* is then poured out at the feet of the Bráhman and the *janeo* is changed to the left shoulder. This is followed by the usual rinsing of the mouth, after which the verse commencing:—'*Yasya, &c.*' is recited.

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* *Om svadhá pitṛibhyo mátṛibhyo bandhubhyaś cha tṛiptaye, mátṛipakshâś cha ye kechit ye kechit pitṛipakshajáḥ, guruśvaśurabandhúnáṃ ye chánye kulasambhaváḥ, ye pretabhávam ápannáḥ ye chánye śráddhavarjitáḥ vṛishotsargeṇa te sarve labhantáṃ tṛiptim uttamám.*

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* See previous page.

† The *ekoddishṭa* or *tithi-śráddha* is that performed on the anniversary of a father's death, whilst the general ceremony which takes place during the dark half of Kuár is called the *párvan* or *kanyágata-śráddha*. If the father dies during this part of Kuár the ceremony is called *Kshayáha-śráddha*. In the *párvan* the usual fifty-five piṇḍas are offered ; in the *ekoddishṭá* only one.

Ceremony of the twelfth day.—On the twelfth day the ceremony known as *Sapindi* takes place. The celebrant goes to the *ghát* as before and commences with bathing and dedication to the day's rite. He then makes three altars of the same dimensions as before: to the north, a square altar called the *Viśvadeva-bedi:* to the south, a triangular altar called *Preta-bedi,* and to the east a circular altar calldd the *Pitámahádi-bedi.* Rice is then cooked and whilst it is being made ready, two Bráhmans are formed from *kuśa*-grass and placed at the northern altar as in the preceding ceremony with a formal invitation, during which barley is sprinkled over them whilst they are asked to take part in the *sapindi.* The following verse is then repeated:—*Akrodhanaiḥ sauchaparaiḥ satataṃ brahmachāribhiḥ, bhavitavyaṃ bhavadbhiś cha mayá cha śráddhakáriṇá, sarváyása-vinirmuktaiḥ kámakrodhavivarjitaiḥ.* Then the southern altar is approached and there the bundles of *kuśa* representing the deceased are placed. These are addressed as above with the verse—'*Gato'si, &c.,*' to which is added the line:—*Pújayishyámi bhogena devavipraṃ nimantraye.* Then follows the changing of the sacrificial thread to the left shoulder and purification by rinsing the mouth before approaching the eastern altar. This is consecrated to the ancestors of the deceased for three generations in the male line, all of whom are named and represented by blades of *kuśa*-grass. If a mother is the subject of the ceremony the names of the father's mother, grandfather's mother, &c., are given here. Next the wife's ancestors for three generations in the male line are invited and some one accepts on behalf of all and their feet are washed with the mantra:—'*Akrodhanaiḥ, &c.*' This also takes place at the other two altars and is followed by the celebrant taking the *pavitra* or knot of *kuśa* and sticking it into the folds of his waist-cloth (*nívi-bandhana*). Each of the altars in order are again visited and a dedication is made to the *kuśa* representatives at each with the *argha,* seat, invitation, sandal, rice, flowers, incense, lights, apparel, betel and a stone on which the rice is placed for making the *piṇḍas.* The placing the stone and rice at the northern altar has the special mantra:—*Om agnaye kavya-váhanáya sváhá idam agnaye, om somáya pitṛimate svadhá idaṃ somáya.* At the southern altar the celebrant merely mentions the name of the deceased and that for him the food has been prepared, and at the eastern altar the stone and food are dedicated to the *pitṛis* who are named as before. The remaining rice is placed on another stone and mixed with honey, clarified butter and sesamum is divided into four *piṇḍas.* A small portion of rice is then taken with a blade of *kuśa* in the right hand and the hand is closed over the rice whilst this verse is recited:—*Asamskrita* *pramítánáṃ tyáginám kulabhágináṃ uchchhishṭa-bhágadheyánáṃ darbheshu vikiráśanam.* It is then cast on the ground near the *piṇḍas* and is called the *bikira-dán.*

Then kneeling on the left knee with *janeo* reversed a *piṇḍa* is taken with *kuśa*, sesamum and water in the name of the father of the deceased with the prayer that the earth here may be holy as Gya, the water like that of the Ganges, and the *piṇḍa* be like *amṛita*, and is placed on the altar. Similarly a *piṇḍa* is taken and dedicated to the grandfather and great-grandfather of the deceased respectively. The last is dedicated to the spirit of the deceased that he may cease to be a disembodied spirit and become enrolled amongst the ancestors. Next follows the usual gifts with dedication. The celebrant next divides the *piṇḍa* of the deceased into three parts with a golden skewer and attaches one part to each of the *piṇḍas* of the ancestors with the mantra :—*Ye samánáḥ samanasaḥ pitaro yamarájye, tesháṃ lokaḥ svadhá namo deveshu kalpatám, ye samánáḥ samanaso jívá jíveshu mámakáḥ, teshám śrír mayi kalpatám asmin loke śataṃ samáḥ.* The spirit thus becomes an ancestor and ousts his great-grandfather in the line of the *párvaṇa*. Water is then presented and the *pavitra* is thrown away; rice is next sprinkled over the three *piṇḍas* with the *mantra* :—*Oṃ namo vaḥ pitaro rasáya namo vaḥ pitaro jíváya namo vaḥ pitaro sukháya namo vaḥ pitaraḥ pitaro namo vo griháṇa pitaro dattaṃ sado vaḥ pitaro pitaro vásaḥ.* The same *mantra* is repeated whilst laying three threads on the *piṇḍas* to represent their *janeos*. Next water, sesamum and *kuśa* are presented with a dedication. Milk is then poured through the hand over the *piṇḍas* whilst the preceding *mantra* is repeated. All now march round the altar whilst the celebrant recites the *mantra*:—*A'mávájasya prasavo jagamyáṃ deve dyávápṛithiví viśvarúpe ámá gantám pitarámátará chárṇá somo amṛitatve jagamyám.* Then the celebrant gives himself the *tilaka* with the *mantra* :—*Oṃ pitṛibhyaḥ svadhá ebhyaḥ svadhá namaḥ pitámahebhyáh svadhá ebhyaḥ svadhá namaḥ prapitámahebhyaḥ svadhá ebhyaḥ svadhá namaḥ akshaṇa pitaro mímadanta pitaro 'tîtṛipanta pitaraḥ pitaraḥ sundadhvam.* Next the *áśis* or benediction occurs in which with hands clasped the celebrant prays for the increase in prosperity of his family, their defence in time of trouble, &c. The *piṇḍa* of the father is then removed from the altar and in its place the figures of a conch, discus, &c., are drawn with sandal and on them a lighted lamp is placed and saluted whilst rice is sprinkled over it. The *mantra* used is :—*Oṃ vasantáya namaḥ, oṃ gríshmáya namaḥ, oṃ varshábhyo namaḥ, oṃ śarade namaḥ, oṃ hemantáya namaḥ, oṃ śiśiráya namaḥ*—forming an address to the seasons. The *piṇḍa* is then restored to its place on the altar and the bundle of *kuśa* which represents the Bráhmans at the northern altar is opened out and one stalk is thrown towards the heavens whilst saying :—'Praise to the ancestors in paradise.' Then follows the verses :—"*Sapta vyádhá daśárṇeshu*," *&c.*, as in the termination of the *Nándi-śráddha*, after which the materials for the ceremony are removed and gifts again made to Bráhmans. Next the celebrant proceeds to a *pípal* tree, or if no such tree be near a branch is brought from a tree and a dedication is made in the name of Vishṇu of three hundred and sixty vessels of water which is poured over the tree and then the tree is tied round with thread three times and whilst moving round, the following *mantra* is repeated :—"Glory to thee O king of trees whose root is like Brahmá, trunk Vishṇu and top like S'iva." The ceremony concludes with the usual gifts and dedication.

Monthly ceremony.—On every monthly return of the date on which a father dies a single *piṇḍa* is offered to his manes as before with a vessel of water to the *pípal* tree. This continues for eleven months and in the twelfth month the *Hárshika-śráddha* takes place which is in all respects the same as the *Ekoddishṭá-śráddha* already described. The *Nárάyaṇa-bali* is offered when a father dies in a strange land and his relatives cannot find his body to perform the usual rites. A figure of the deceased is made of the reed *kans*, and placed on a funeral pyre and burned with the dedication that the deceased may not be without the benefit of funeral rites Then the *kalaśa* is consecrated and the forms of Brahmá, Vishṇu, S'iva and Yama stamped on pieces of metal are placed on the covering of the *kalaśa* and are worshipped with the *Purusha-súkta mantra* from the Ṛig-veda (*Maṇ.* 10, 90). Then sixteen *homas* and ten *piṇḍas* are offered with the usual dedication and the latter are thrown into the water. Sixteen offerings of water from both hands *(anjali)* conclude the ceremony. A separate ritual is prescribed for a woman dying whilst in her courses or dying in child-birth. The body is anointed with the *pancha-gavya* and sprinkled with water whilst the *mantra*—'*Apohishṭa,*' &c.,' is recited. The body is then taken and a small quantity of fire placed on the chest after which it is either buried or thrown into flowing water. For eight days nothing is done, but on the ninth day, forty-five *piṇḍas* are given and the ceremonies of the remaining three days as already described are carried through if the people can afford it. There is also a separate ritual for persons who have joined a celibate fraternity as a Jogi, Gosáin, &c. His staff and clothes are placed on the chárpái as in the case of an ordinary person and the *arka-viváha* or marriage with the plant *madár* takes place, after which a *piṇḍa* is offered in his name. *Fakírs*, lepers and women who die in child-birth are buried in Kumaon. It is believed that if any one dies during the Dhanishṭhá, Satabhishá, Púrvabhádá, Uttarabhádá or Revatí *nakshatras* or lunar-mansions, four others of his family will certainly die, and for the avoidance of this evil a *śánti* or preventive service is prescribed which must be held by the relatives and be accompanied by numerous gifts.

Bhojana-karma.—The observances connected with the preparation and cooking of food are classed amongst the domestic ceremonies and are known as *Balivaiśvadeva.* After the food has been cooked and before it is eaten, the person takes a small portion of it in his right hand and offers it as a *homa* on the fire whilst repeating the mantra* :—*Oṃ* salutation to Agni, the vital air *práṇa ; oṃ* salutation to Váyu, the vital air *apána ; oṃ* salutation to Aditya, the vital air *vyána;* salutation to the same three deities, the same three vital airs ; salutation to him who is fire produced from water, juicy nectar, Brahmá, &c. The *gáyatrí*-mantra† with the addition of the term *sváhá* after each section is then repeated as often as the person wishes. The *homa* or burnt-offering can only be made where the person can procure some clarified butter, where it cannot be obtained the *homa* must be omitted. Water is then taken in the hand and poured on the ground whilst the mantra‡ is repeated :—'If whoever eats remembers that Brahmá, Vishṇu and S'iva are present in the food impurity cannot accrue from eating.' Where the water has fallen four small portions§ of the food are thrown one after the other with the following mantra :—'*Oṃ*, glory to the lord of the earth ; *oṃ*, glory to the lord of created things ; *oṃ*, glory, glory to the lord of sprites ; *oṃ*, glory to all beings.' Water is again taken in the hand whilst a mystical *mantra*|| is recited. The water is then drank. Next about a mouthful of the food is taken in the hand and thrown away as the portion of dogs, low-caste persons, deceased,

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* *Oṃ bhúr agnaye práṇáya sváhá oṃ bhuvar váyave apánáya sváhá oṃ svar ádityáya vyánáya sváhá oṃ bhúr bhuvaḥ svaḥ agniváyvádityebhyaḥ práṇápánavyánebhyaḥ sváhá oṃ ápo jyoti raso' mṛitaṃ brahma bhúr bhuvaḥ svaḥ oṃ sarvan, vai púrṇaṃ sváhá.* Here the three kinds of vital airs are mentioned: *práṇa*, that which issues from the lungs ; *apána*, from the anus and *vyána* that which circulates through the body. The usual number is, however, five and hereafter we have added, *samána* that which is common to the whole body, and *udána*, that which rises through the throat to the head. *Sváhá* has the meaning probably of a good oblation or offering, and is here used with the mystical *vyáhṛiti* mantra.

† See previous page.

‡ The learned use the mantra:—*Oṃ nábhyá asíd antarikshaṃ śírshṇo dyauḥ samavarttata padbhyáṃ bhúmir diśaḥ śrotrát tathá lokán akalpayan.* The verse translated above is, however, far more common and runs:—*Annaṃ brahmá raso vishṇuḥ bhoktá devo maheśvaraḥ evaṃ dhyátvá dvijo bhunkte annadosho na díyate.* The ordinary cultivator seldom uses more than the three last words—'*annadosho na díyate.*'

§ *Oṃ bhúpataye namaḥ oṃ bhuvanapataye namaḥ oṃ bhútánáṃ pataye namaḥ oṃ sarvebhyo bhútebhyo balaye namaḥ.*

|| *Oṃ antaścharasi bhúteshu guháyáṃ visvatomukhaḥ tvaṃ yajñaḥ tvaṃ vashaṭkáraḥ ápo jyoti raso'mṛitaṃ sváhá.* The word *vashat* is an exclamation used in making oblations and *vashatkára* is the making it.

crows and ants.* The correct custom is to make one offering for each of these six classes whilst repeating the mantra, but in practice a very small portion is placed on the ground with the ejaculation:—'*Oṃ*, glory to Vishṇu.' The food is then eaten whilst with the first five mouthfuls (*páncha-grási*) the following mantra is recited mentally:—*Oṃ*, salutation to the five kinds of vital air, *viz.*, *práṇa*, *apána*, *samána*, *vyána* and *udána*.' Then a little water is poured over the *bali* with the mantra:—*Oṃ* salutation to the *bali*,' and at the end of the meal the same is repeated with the verse†: 'May the giver of the meal have long-life and the eater thereof ever be happy.'‡

The battle of Kanarpí Ghát, edited and translated by S'rí Náráyaṇ Singh, *and* G. A. Grierson.

Introduction.

The following poem, written by a Maithil Bráhman at the end of the last century, in the Baiswáṛí dialect, is perhaps the most popular of its kind in Tirhut. A copy of it in MS. can be obtained in almost any large village in Darbhangá. Owing, however, to the complexity of some of the metres, they are generally very corrupt. Bábú S'rí Náráyan Singh, of Jogiyárá, has joined me in endeavouring to prepare a translation and fairly correct edition of the text.

The poem describes a victory won by Narendra Singh, an ancestor of the present Mahárája of Darbhangá over Rám Náráyan Bhúp, the well-known Súbá of Bihár.§ The following is the genealogy of the present Mahárája:

Mahárája Narendra Singh.
,, Pratáp Singh.
,, Rághab Singh.
,, Mádhab Singh.
,, Chhatra Singh.
,, Maheśwar Singh.
,, Lakshmíśwar Singh, the present holder of the title.

The Baksí or Bakhshí mentioned in Dohá 5, line 9, and Dohá 19, l. 1, was Gokul Náth Jhá, of Ḍhangá, Haripúr, Pargana Jafail, in the

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* *S'unám cha patitánám cha śvapachám páparogiṇám, váyasánám krimiṇám cha sahatair nirvapet bhuvaḥ.*

† *Annadátá chiranjíví annabhoktá sadá sukhí.*

‡ [The reading of some of the mantras was too corrupt to admit of thorough correction.—Ed.]

§ See note to verse 1 of the translation.

Darbhangá District. His great-grandson Márkáṇḍe Jhá, is the Bakhshí to the present Maháráj, as follows:

Gokul Náth Jhá.
Sáǒe Jhá.
Mohan Lál Jhá.
Márkáṇḍe Jhá.

The Sarb Ján Jhá mentioned in Chhand 6, l. 7, was a famous prophet, who knew everything. A story of him is told that his servant once accidentally threw away his Narbadeśwar (an image of Śivá). Shortly afterwards Sarb Ján missed it, and declared that it had been eaten up by one of his ducks. All the ducks were brought before him, and he picked out one, which was killed. In its crop was found the missing image.

The poem is full of names of persons and places of whom and which little or nothing is at present known.

Narendra Singh is the most celebrated. Of him the poet Chandra Jhá, says in his Maithil Rámáyan,

क्षिपति नरेन्द्र सिंह भेल जखन ।
  अरि घर कानन पसरल तखन ॥
ताकि ताकि सत्रुक संहार ।
  कैलन्हि बहुत क्षात्र व्यवहार ॥
कतऊँ युद्धि नहिँ ऐलाह हारि ।
  अतिसय तेज तनिक तरुआरि ॥

'When Narendra Singh became king, weeping filled his enemies' houses. He searched for and became a destroyer of his foes, and performed many chivalrous actions. Nowhere did he lose a battle, and his sword was very sharp.'

The other names recorded will, if they can be identified, be useful to students of history of the last century.

The author of the poem, Lál Jhá, a bráhmaṇ, lived in Mangrauní Pargana Hátí, Darbhangá District. His great-grandson is now alive in the same village. The family still owns the village of Kanail which was given to the poet by Narendra Singh.

The metres employed in the poem are the Dohá (Nos. 1, 3, 5, 7, 10, 12, 14, 16, 18, 20, 23, and 25), the Bhujangaprayát (Nos. 2, 6, 11, 17, 19, 21, and 24), the Nárách (Nos. 4, 15, and 22), the Tribhangí (Nos. 8 and 13), and the Pádákulak (No. 9).

The Dohá is well-known, and need not be described at length. The following Prákrit lines describe it, and are current in Mithilá :

तेरह मत्ता पढम पइ, पुण एगारह देह ।
पुण तेरह एगारहहिँ, दोहा लक्खण एह ॥

'Put thirteen instants in the first half-stanza, and eleven in the second, then again thirteen and eleven, and this is the description of the dohá.' The above is itself an example of the metre.

The Bhujangaprayát, which closely corresponds to the Hansagati Chhand described in Kellogg's prosody, p. 22, consists of four Bacchics (◡ — —), called यगण or य in Indian prosody. The rule current concerning this metre is भुजङ्गप्रयात भवेद्यैश्चतुर्भिः.

The Narách consists of eight Iambics (◡ —), लगण or लग in Indian prosody. The following Prákrit verses are examples of the metre, and at the same time give the rule for its formation.

लहु गुरु निरंतरा, प्रमाणि अट्ठ अक्खरा ।
प्रमाणि दूण किज्जिए, णराउ सो भणिज्जिए ॥

'A Pramáṇiká verse consists of eight syllables, a long and a short one alternately. Double the Pramáṇiká and it becomes the Narách.'

The Tribhangí Chhand consists of 32 instants, divided into 10 + 8 + 8 + 6 instants. It is described in Kellogg's prosody, p. 23 Each line must end with a long syllable. The following Prákrit example gives the rule :

पढमं दह रहणं अट्ठवि रहणं पुण वसु रहणं रस रहणं ।
अंते गुरु सोहइ णिरुक्खण मोहइ सिद्धि संरोहै वर तरुणं ॥
जइ पलइ पयोहर किमिव मणोहर हणइ तहाँ णायक गुणी ।
तिरिभंगी छन्दं सुक्खाणंदं भणइ फणिंदो विमल मई ॥

'First stop on the tenth instant, then on the eighth, then again on the eighth and on the sixth. The last letter of the line must be long. The wise Phaṇíndra says that this verse if in proper form enchants the three worlds, accomplishes the objects of full grown youths, and creates happiness. But if it is not so, it is like a damsel with pendulous bosom, annoying to her lord.'

The Pádákulak consists of 64 instants, divided into four quarter-verses of 6 + 4 + 4 + 2 instants each. The last syllables of the second and fourth quarters must be long. G. A. G.

अथ कनरपी घाट लड़ाइ ।

॥ १ ॥ दोहा ।

राम नरायन भूप तैं कह्यौ मुखालिफ आय ।
हाकिम को मिथिलेश ने दीन्हो अदल उठाय ॥
सीर करो तिरहुति को ता के रची उपाय ।
फौजदार मह्था भए सङ्ग सलाबति राय ॥
बखत सिङ्ह कुल उद्धरन रोउ मल्ल दिल पूर ।
चौभान भानु भानु सुकुल एक एक तैं सूर ॥
याही सभ सैनाथ करि फौजे पाँच हजार ।
दिगसूल सन्मुख जोगिनी मह्था उतरे पार ॥ १ ॥

॥ २ ॥ छन्द भुजङ्गप्रयात ।

चले फौज नाजिम को बाजत नगारे ।
सभे खुल गए तोपखाने सकारे ॥
घटा गज के ऊपर सों गांजत निशानें ।
जजायिल धमक्का लसैं चन्द्रबानें ॥
अही धर मही कोल दिक्पाल कम्पैं ।
उड़े गर्द अम्बर भरे सूर झम्पैं ॥
दमामा नफीरी औ करनाल बोलैं ।
बड़े दलदले रे सभे दीप डोलैं ॥
खड़ैतैं खड़े खूब खामिन के आगैं ।
बड़े रङ्ग तैं जङ्ग के जोर पागैं ॥
बड़े मोद ले खुल गए द्वार आबैं ।
औ पक्खर लिए शेख सैअद सबारे ॥
जो आगे छड़ीबान के दल बिराजैं ।
बरच्छा के छाहैं लिए रङ्ग साजैं ॥
चलो औ शिताबी लगी दूर जाना ।
लदे साथ छकड़ में केते खजाना ॥

बड़ो दाप तैं कूच दर कूच आवैं ।
कहौं लाग को नाहि मघवान पावैं ॥
सभैं तो पटी बान्हि कम्मर जड़ावा ।
पुछे राह मैं दूर बैते झवाडा ॥ २ ॥

॥ ३ ॥ दोहा ।

खबरदार ने खबरि करि न्रिप सैं कह्यउ बुझाय ।
पाँच हजार सवार लै महथा पहुँचे आय ॥
न्रिपति बोलाए ज्योतखी कीजै कोटि बिचार
इहाँ तो लड़ना है नहीं बडी बलान के पार ॥
भूप महूरति सकल करि बाहिर बैठे आय ।
कीजे फौज तयार तू कह्यौ नकीब बोलाय ॥ ३ ॥

॥ ४ ॥ छन्द नराच ।

कह्यौ नकीब धाय धाय फौज बीच जाय कै ।
तयार हो बहादुरो सभे सिलाह लाय कै ॥
तयार होन को लगे जमातिदार गज्जई ।
दसो दिसा अनोर सोर घोर बम्म बज्जई ॥
कहूँ कमान बान सान भाँति भाँति देखिए ।
निदान मों मैदान बीच भीम से बिसेखिए ॥
चले महा बली तयार होय भौन भौन सैं ।
तुरङ्ग छेड़ छाड़ में तुलै न पौन गौन तैं ॥ ४ ॥

॥ ५ ॥ दोहा ।

खारिआत दै सभनि को करि कै बिबिध बिलास ।
चलै सिपाह महा बली मिथिला पति के पास ॥
द्वारपाल भूपाल तैं अर्ज कियो हैं जाय ।
ढालबन्द तैयार ह्वै हाजिर पहुँचे आय ॥
एक एक करि मोजरा सब को कीन्ह सलाम ।
लाल महा कबि बैठि गौ तहाँ जहाँ सुख धाम ॥
दच्छिन बैठे न्रिपति को बाबू और दिमान ।
उत्तर ओझा बैठि गौ साथ लिए मतिमान ॥

पश्चिम सकल सिपाह गन बकसी बैठे पास ।
बने बनाए देखिए पीछे खास खवास ॥
रैनि दिवस हाजिर रहै रतन रतन सो जान ।
मोतसद्दी तखिका करै तोपा बान कमान ॥
बैठे सभ के बीच मोँ महाराज नरइन्द्र ।
सोभा बरनो जात नहिँ ज्योँ तारन मोँ चन्द्र ॥ ५ ॥

॥ ६ ॥ छन्द भुजङ्गप्रयात ।

सुपण्डित कहूँ पच्छ रच्छा सँभारैँ ।
कहूँ चारु बैदिक पढ़ै बेद सारैँ ॥
कहूँ ज्योतखी सो घड़ी नेक साधैँ ।
कहूँ आगमी यन्त्र के मन्त्र साधैँ ॥
कबीश्वर लगैँ सो कड़ाखा बनावैँ ।
कहूँ भाँट बैठे कबित्यँ सुनावैँ ॥
कहूँ सर्व जानै कहूँ सर्व जाने ।
कहूँ कोख साहित्य हूँ को बखाने ॥
कहूँ मोलना सैँ करैँ बैन बातेँ ।
कहूँ मोनसी पारसी रङ्ग रावैँ ॥
कहूँ बल्लभी सो दही हार लावैँ ।
लिए गागरी नागरी रङ्ग लावैँ ॥ ६ ॥

॥ ७ ॥ दोहा ।

राज सभा रजपूत गन बरनत हैँ कबि लाख ।
बैठे चिप चक्र ओर सैँ लिए ढाल तलवाल ॥ ७ ॥

॥ ८ ॥ छन्द त्रिभङ्गी ।

राउत रजपूतैँ सभैँ सपूतैँ लखि पुरहूते सबल डरैँ ।
सुर बैस बुनेला बीर चनेला लसैँ बघेला खड्ग धरैँ ॥
चौभान बिसेना सब्बर सेना रायठौर रन बीर भरैँ ।
हाड़ा कछवाहा लाय सिखाहा हा हा करि कैँ भूमि परैँ ॥
दब्बै अरिदम्भा जाति निकुम्भा बौ गन्धवरिया सूर भवा ।
सेँगर परिहाहा हैहरबाहा हैहयबन्सी भीम भवा ॥

गौतम बिजहरिआ औ सरबरिआ रघुबन्सी नरनाह कला ।
गौड़ा बछगोती सुजस सुमोती गहड़वार निज साजि दला ॥
सिरमोरक कन्दा कौसिक चन्दा बड़गैआँ करचोउलिआ ।
जो सगरबार सरदार सिपाही गौड़ अमैठी चौधरिआ ॥
तोमर गहनौता गुजर समेता रानाबन्सी सिधौटिआ ।
मौनस बिजहरिआ न्रिप नगपुरिआ बड़ महरौड़ी सतौड़िआ ॥ ८ ॥

॥ ९ ॥ छन्द पादाकुलक ।

करम्बार पम्मार कठेला कटहरिआ सुरनेक सिपाही ।
तँह लाल महा कल्लि जान महा छबि अरि गन सीर मैँ असी बाही ॥ ९ ॥

॥ १० ॥ दोहा ।

तुङ्ग तुरङ्गम तरल गति प्रबल जङ्ग मेँ जोर ।
लै लै आवत खोलि कैँ गहैँ बाग को डोर ॥ १० ॥

॥ ११ ॥ छन्द भुजङ्गप्रयात ।

तुर्क्की अरब्बी इराकी सु कच्छी ।
दरायी खन्दारी जितैँ मीन लच्छी ॥
चलै तेज ताजी मुजन्नस पिठानी ।
करै चारु बाजी कहाँ लौ बखानी ॥
भलो चारु कम्बोज अम्बू बनाई ।
मनो थार पारा धरै चञ्चलाई ॥
तुरङ्गा सुरङ्गा लसैँ मीन रङ्गा ।
पिलङ्गा सबैँ सोँ महा नील रङ्गा ॥
जरद्दा मुसुक्की समुन्दा छबीला ।
हराबोज सबजा औ लीला औ तीला ॥
सुरक्खाऽबलक्खा मनो बायु सक्खा ।
सु उच्चैस्रवा को दले दर्प्प देखा ॥
खड़े पञ्च कल्यान कल्यान कारी ।
कपोतच्छबी ज्योँ चितेरे समारी ॥
हजारैँ हजारैँ लगे हेम तारैँ ।
चुनी से जड़ी जीन पट्टा समारैँ ॥ ११ ॥

॥ १२ ॥ दोहा ।

सभैँ सिपाह सलाम करि चढ़्यौ तुरङ्गम खास ।
किल्लाहूँ तैँ मिसि लगी कमला जी के पास ॥
छेमङ्करिनि निहारि नभ भौ बिकसित मुख चन्द्र ।
लम्बोदर बिघ्नेस कहि बहुराए नरइन्द्र ॥
मच्छ पुच्छ के तिलक करि पैन्ह कुसुम के माल ।
कै प्रनाम बिघ्नेस कैँ बहुराने भूपाल ॥ १२ ॥

॥ १३ ॥ छन्द त्रिभङ्गी ।

सुर पुर के राजा सङ्कहि भाजा मेरु समाजा जम्य परैँ ।
तहाँ करत बड़ाइ दुर्गा माई लेऊ बचाई अधिक डरैँ ॥
को गनति महीसा रङ्काधीसा लावैँ सीसा सुनि ठहरैँ ।
धूली के दप्पैँ दिनकर झप्पैँ मेदनि कम्पैँ को ठहरैँ ॥
बीजापुर बङ्गा औध सुरङ्गा जित नृप सङ्गा जोग भरैँ ।
ऊगली कलकत्ता नृपतनि सत्ता तेजहि लत्ता फिरति फिरैँ ॥
दच्छिन नर नाहा तेजि सिलाहा भेजहि बाहा को ठहरैँ ।
ढक्का के रानी फिरहिँ देवानी औ मकमानी नृप हहरैँ ॥
डिल्ली सगबग्गी कासी भग्गी बेतिआ टग्गी को ठहरैँ ।
दीनन सभ के गति डरत सकप अति मैथिल भूपति को बहरैँ ॥ १३ ॥

॥ १४ ॥ दोहा ।

किल्लाहूँ तैँ कूच करि कर मैँ गहो कमान ।
महाराज डेरा दियो हरिना के मैदान ॥ १४ ॥

॥ १५ ॥ छन्द नराच ।

बड़ी बड़ी बनात की कनात जाहि राउटी ।
तहाँ तहाँ जमाहिरे जड़ाउ लाल तैँ जटी ॥
लगे लगे हजार हेम तार कोर सो भरै ।
कहू कहू बितान आसमान ल्यो रहैं खरै ॥
कहूँ अनेक रूप की बिचित्र पालकी पड़ी ।
कहूँ हजार के सिलाह और लालकी धरी ॥
कहूँ तुरङ्ग औ मतङ्ग सोँ धरे हजारहीँ ।
कहूँ कमान और बेस बान बेसुमारहीँ ॥

काहूँ अनेक दुन्दुभी मिरदङ्ग रङ्ग रङ्ग के।
कहूँ सिपाह तुङ्गदार जेतवार जङ्ग के ॥ १५ ॥

॥ १६ ॥ दोहा।

उरदू न्रिप मिथिलेस को बरनत हैं कबि लाल।
अमर नगर तैं चौगुनौ लागत अधिक बिसाल ॥ १६ ॥

॥ १७ ॥ छन्द २ भुजङ्गप्रयात।

फुहाड़ा गड़े औ बने चाह हट्टा।
हजारी बेपारी चलै बान्हि ठट्टा ॥
घनेरे जहाँ जाचि के जाचि आवैं।
नयी अङ्गना सो बनी गीत गावैं ॥
कहूँ कन्द चीनी बिकै नोन गट्टा।
कि जाके चखे तैं सुधा होत खट्टा ॥
कहूँ तैं बतासा बनै औ मिठाई।
कहूँ आनि मेवा धरे हैं बनाई ॥
कहूँ मीसरी औ जिलेबी पके हैं।
करैं मोल जोलैं बहूतो खड़े हैं ॥
कहूँ सक्करे औ बिकै गूड़ चक्की।
कहूँ तैं सोहारी धरी घीउ पक्की ॥
जबाड़ा सरोही कहूँ तेग बिक्कैं।
कहूँ जोहरे मोहरे देत सिक्कैं ॥
कहूँ तोसखाने लगी भीर भारी।
तुरङ्गैं बिकै लच्छ कच्छी खन्धारी ॥
कहूँ मत्त मातङ्ग ऊँटै घनेरा।
कहूँ चित्र लेखत खड़े हैं चितेरा ॥
कहूँ दाख लाखैं कहूँ हैं छोहाड़ा।
कहूँ होज मैं बेस छूटत फोहाड़ा ॥
कहूँ बादला लाल बाफी दोसाला।
कहूँ लाल मोती बिकैं कण्ठ माला ॥
कहूँ बाफदा थान खासा पोसाकी।
कहूँ नाहि जाने कोऊ मोल जा को ॥ १७ ॥

॥ १८ ॥ दोहा ।

रामपटी तैं कूच करि पड़ै अचानक जाय ।
तब डङ्का भूपति सुन्यो नाजिम पहुँचै आय ॥ १८ ॥

॥ १९ ॥ छन्द भुजङ्गप्रयात ।

दोऊ ओर फौजैं भयी हैं तयारी ।
तहाँ बीच दरम्यान दरिआओ भारी ॥
चलै बान कम्मान गोला हजारे ।
सभैं एक हो कै गिरै जो सितारे ॥
छड़ीबान छूटै गजर के घड़ी सी ।
छकी आसमानो लगी फुलझड़ी सी ॥
पहुँच के बहेलिएँ ने गोली सैं मारी ।
हटी जाय पीछे लटी फौज सारी ॥
जो घाइल पड़ै सो चढ़नु जाय खाटैं ।
कहूँ कोउ आओन सकै नाहि बाटैं ॥ १९ ॥

॥ २० ॥ दोहा ।

बकसी सै भूपति कह्यौ चढ़ि देखो मैदान ।
रहो सभै होसिआर सैं करि है दगा निदान ॥
जाफर खाँ को साथ करि दूजै हाला राय ।
डङ्का दै बकसी चलैं चढ़ै खेत पर जाय ॥
महुथा पेच खेलाय कै काऊ देखायो बाट ।
चढ़ी सवारी पार कै गङ्गदुआर को घाट ॥
धावा करि कै आप्र गौ बिस्नुपूर है टोल ।
हलकारे न्रिप सैं कह्यौ भयौ मोहब्बिल गोल ॥
आए दोउ महा बलो मित्रजीत उमराओ ।
भूपति को परनाम करि दियौ रिकेबनि पाँचो ॥ २० ॥

॥ २१ ॥ छन्द भुजङ्गप्रयात ।

चलैं बैस बघेल बछबैत हाड़ा ।
लिएँ हाथ के बीच तेगा जड़ावा ॥
बनै सूर के सूर हाड़ा बिराजैं ।
चहू ओर सैं दुन्दुभी जोर बाजैं ॥

चलै बान कम्मान गोला हजारैं ।
बहादुर दोऊ बाग को नाहि फेरैं ॥
कदम दर कदम तैं पड़ी फौज जाई ।
महा अष्टमी को लगी है लड़ाई ॥
दमामा नफीरी घनैं सङ्ख बाजैं ।
अनोरे पड़ो राम चङ्के अवाजैं ॥
उठाई सलाबति ने घोड़े के बागैं ।
भए सिङ्घ उमराओ आड़े हो आगैं ॥
बहादुर दोऊ को कहाँ ल्यो बड़ाई ।
पड़ी कर्न पारथ के ऐसी लड़ाई ॥
निकलि खाप तैं खूब तेगा चली है ।
महा घन घटा दामिनी जो भयी है ॥
जखम खाय पीछे भए हैं नचारा ।
पकड़ि कैं सलाबति को नीचे दै मारा ॥
चलै धाय कै देखि आगे भिखारी ।
पऊँच तो सके नाहि हौदे को मारी ॥
लगी आनि गोली गिरै बीर बङ्का ।
भरी सी पुरन्दर पुरी जाय सङ्का ॥
चहू ओर जा की छकी कीर्त्ति जाई ।
लिएँ फूल माला परी पास आई ॥
बड़ो बीर साथी हजारैं हजारैं ।
सभै छाड़ि घोड़ा भयो हैं उतारैं ॥ २१ ॥

॥ २२ ॥ छन्द नराच ।

पड़ै उठाय धाय धाय एक एक सैं लड़ैं ।
मनो गजेन्द्र सो गजेन्द्र जङ्ग जोर को धरैं ॥
महीप मित्रजीत राओ बखत सिङ्घ को धरैं ।
चखा चखी चपेट चोट लोट पोट ह्वै गिरैं ॥
सनासनी घनाघनी सुनी न जात तीर के ।
पड़ै जो खूब रङ्ग रङ्ग जङ्ग जो अमीर के ॥
जमातिदार और चोट को करैं निरन्तरा ।
पड़ै कमान बान सैं मही अकास अन्तरा ॥

सुन्यो बिपच्छ पच्छ लच्छ धीरता तबै गयी ।
धड़ा धड़ी हजार बार तोप की जबै भयी ॥
उठे अनोर घोर सोर ढाल की चटा चटी ।
जहाँ तहाँ चहू दिसा क्रिपान की खटा खटी ॥
भला भला हला करैं लड़ैं जो बीर कोप सैं ।
बदा बदी गिरैं जो मुण्ड कोटि कोटि धोप तैं ॥
कटैं कबन्ध भूमि घूमि घोर भाउरी भरैं ।
हहा गिराय कै हलाल कोऊ काऊ को करैं ॥
सुमुण्ड कञ्ज रक्त पानि औ सेमार केस के ।
नदी बही जहाँ तहाँ मैदान मीथिलेस के ॥
भयो फतेह बैरि जाल को निदान भोगिनी ।
गयी अघाय खाय खाय गण्ड मुण्ड जोगिनी ॥
असेख मुण्ड माल जाल कालिका लै आउती ।
कराल भूत साथ भूतनाथ को पेन्हाउती ॥
सबै फिरै मैदान छाड़ि फौजदार भागि गौ ।
भयो फतेह भूप को सुकीर्त्ति बम्ब बाजि गौ ॥ २२ ॥

॥ २३ ॥ दोहा ।

रन फतेह भौ भूप को फौजदार गौ भागि ।
चौगुन कै तिरहुति को कीर्त्ति उठी है जागि ॥
छाड़्यौ हाकिम जानि कै फक्त भिखारी एक ।
राखि लियौ जगदम्ब ने महराज के टेक ॥ २३ ॥

॥ २४ ॥ छन्द भुजङ्गप्रयात ।

जो पीछे लगे हैं सभैं राओ राने ।
लुटै तोसखाने नगारे निसाने ॥
कहूँ पालकी लालकी कोटि हीरा ।
लुटै तोसदानैं भरैं खास बीरा ॥
औ तम्बू कनातैं लुटैं ऊँट गाड़ी ।
लुटे हैं कहूँ कोऊ काहू पिछाड़ी ॥
बरच्छी धमाका लुटे साँगि नेजा ।
गये हैं कहूँ कोऊ काहू करेजा ॥

कहुँ बाजि हाथी लुटै बैस धाईं ।
हाराज जू को फिरी हैं दोहाईं ॥ २४ ॥

॥ २५ ॥ दोहा ।

लूटि कूटि लौच्यो सभनि लिधुर लपेटे अङ्ग ।
लाल सुकवि प्रह भाँति भौ समर भिखारी भङ्ग ॥ २५ ॥

इति ॥

TRANSLATION.

1. *Dohá.*

To Rám Naráyan Bhúp* came, an enemy (of Narendra Singh) and said, 'the Lord of Mithilá has cast aside the rule of government.' So he arranged to take Tirhut under direct management, and Mahthá was appointed general in company with Salábati Ráy. There were, also, Bakht Singh, the liberator of his family, courageous Roṛ Mall, who was the sun among the Chaubháns, and Bhánu Sukul, each a greater hero than the other. Such men were taken into service, and Mahthá with five thousand men at arms crossed the river when *diksul* and *joginí*† were in front of him.

2. *Chhand Bhujangaprayát.*

The governor's army proceeded, and the kettle-drums beat. All the artillery was brought out at daybreak. Over the black coloured elephants flapped the flags, and long muskets, elephant-cannons and *chandrabáns*‡ shone. S'esha, the mountains, the earth, the mundane boar and the elephants of the quarters shook from the trampling, and the dust arose and filled the sky and covered the sun. Drums, trumpets and trombones sounded, and the whole earth quivered, and each continent shook. The sword-bearers as they stood before their masters were joyful, as their vigour for battle came to a head. With great pleasure the gate opened, and there issued forth Shekhs and Saiyads who took horse-armour and rode. In front gleamed the wand-bearers, feeling happy under the shadow of their spears. 'Speed on, we have far to go, and vast treasure is loaded in the carts.' They marched with great valour from one halt to another, Indra himself could not match their magnificence. They had all waist-bands set with jewels, and on the way inquired the road to Bhawáṛá.*

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* The well-known Súbah of Bihár, who flourished during the last century. He was drowned by Mír Kásim on A. D. 1773.

† An inauspicious planetary conjuncture. *Diksul* is a day on which it is inauspicious to go in a certain direction; such as Friday and Sunday for West, and Saturday and Monday for East. Compare the proverb दाहिन जोगिन पीछे काल, धर फाड़े मुद्दई का गाल, if one starts when *joginí* is to his right and *kál* behind him, he will seize his enemy by the throat and kill him.

‡ Different kinds of ancient guns.

3. *Dohá.*

The news-bearers informed and told the king (of Tirhut) that Mahthá had arrived with five thousand cavalry. The king sent for his astrologers, and asked them to calculate, and (after hearing their decision) determined not to engage in battle there (at Bhawáṛá), but on the other side of the great Balán.† When he had settled all this, he came out and sat down, sent for the heralds and told them to have all the army in readiness.

4. *Chhand Narách.*

The heralds went into the midst of the army and running hither and thither proclaimed, 'be ready, brave men, and take up your arms.' They commenced making themselves ready, as the captains thundered out their joy. On all sides was heard a continuous noise, and a terrible uproar uprose. Everywhere were displayed bows, arrows and javelins of various kinds. In one's judgment it appeared as if each soldier in the midst of the field was superior to Bhíma. The mighty warriors got ready and issued from their houses, and their horses excelled the wind itself in speed.

5. *Dohá.*

The mighty warriors distributed alms to all, and after enjoying various pleasures proceeded to the (palace of the) king of Mithilá. The warder at the gate approached and told him saying 'the belted soldiers are all ready and present.' One by one they paid their respects to him, which he accepted. Lál, the great poet, says that they sat round the

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* A village close to Madhubaní in the Darbhangá district, a former seat of the Darbhangá Ráj.

† There are in Darbhangá two rivers called Balán, *viz.* the Baṛi- or great-Balán and the Bhutiyá or ghost-Balán. The former enters British territory from the Himálaya at Laukahá and runs north and south about thirty miles east of Madhubaní. The latter lies more to the east, and never has the same bed two years running, continually disappearing from one place and reappearing elsewhere,—hence its name.

Abode of Happiness. To his south sat the Bábús* and the Prime minister, to his north the wizards and the wise men, to his west the soldiers, and near him the Bakhshí† and the chief house-servants in gorgeous apparel stood behind him. The chief of the exchequer who attended day and night, and who knew about all jewels, was making a list of excellent‡ bows and arrows. Mahráj Narendra sat in the midst of all. Who can describe the splendour of one who was like the moon in the midst of stars?

6. *Chhand Bhujangaprayát.*

In one place a pandit was supporting his views in discussion, in another the skilled Baidiks were singing the essence of the Vêdas. In another astronomers were correcting the time-piece, in another Tántriks were reading charms and exorcisms, in another great poets were composing hundreds of martial songs, in another panegyrists recited epics, in another Sarb Ján Jhá§ was dictating as if he knew everything, in another people explained dictionaries and rhetoric, in another they discussed Persian verses with learned Maulwís, in another Munshís sat elated with Persian knowledge, in another dairy-maids brought tyre to the gate, and in another fair damsels with water jars added to the pleasures.

7. *Dohá.*

The poet Lál describes the various Rajpúts who were in the royal assembly, who sat round the king armed with swords and shields.

8. *Chhand Tribhangí.*

Ráuts and Rajpúts, all worthy sons, seeing whose valour even Indra with his army was put to fear, warlike Baish, Bandelá, heroic Chandelá and Baghelá|| armed with swords were conspicuous, Chaubhán Bisená who formed the strong portion¶ of the army, and Ráyṭhaur, who filled the troops with heroes. Háṛá and Kachhbáhá came with their weapons, men who cried 'Há, Há' and fell upon the enemy, Dabbai, Aridambhá, Nikumbhá, and Ganhwariyá the great heroes, Sĕgar, Paribáhá, Haiharbáhá, and Haihaybansí, the terrible champions, Gartam, Bij'hariyá, Sarbariyá, and Raghubansí, the perfect princes, Gauṛá,

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* In Mithilá this word is a high title of honour, reserved to relations of the Darbhangá Mahráj.

† See introduction.

‡ तेाफा = تحفا

§ See introduction.

|| These are all names of Rajpút tribes.

¶ सब्भर is for सबल *m. c.*

Bachhgotí of fame as pure as beauteous pearls, and Gahaṛwár, each with his own followers, Sirmorak, Kandá, the moon of the Kausik family, Baṛgaiyã', and Karchoáliyá, Sagarbár the chief of warriors, Goṛ, Amaiṭhí and Chaughariyá, Tomar, Gahnautá and Gujar, Ránábansí and Sidhauṭiyá, Maunas, Bij'hariyá, the king of Nágpur, the great Mahrauṛí and Satauṛiyá,

9. *Chhand Pádákulak.*

Karambár, Pammár, Kaṭhelá, Kaṭ'hariyá, and the warrior Surnek. Lál the great poet knows the great grandeur of the warriors who were accustomed to wield swords upon their enemies' heads.

10. *Dohá.*

Horses, tall, swift in speed, and mighty in the fierce battle-field,—these they untied, caught hold of their reins and brought out.

11. *Chhand Bhujangaprayát.*

Turkish, Arab, Iráki, and excellent Kachchhí; sea horses and the Kanhári which excelled the Lachchhí fish in speed. None can describe the graceful paces of the swift Tází, Mujannas, and Piṭhání, excellent, graceful steeds of Kamboj, as mobile as water, and fleet as quicksilver in a metal dish. The horses shone of various colours,—there were chestnut ones, and fish-coloured ones, light yellows, and very dark blues, tawny yellows, dark blacks, and handsome browns, iron-greys, greys, blues and blacks, bays and whites which were companions of the wind in speed, and broke down the pride of Indra's horse Uchchaissravá. Horses blazed on the five lucky places,* stood as if they themselves were giving luck. Some were of the colour of pigeons, and seemed as if they had been coloured by painters. The saddles and bridles were embroidered with thousands of varieties of gold wire and diamonds.

12. *Dohá.*

Each warrior saluted and mounted his own horse. From the fort to the Kamlá† they formed a dense crowd. King Narendra saw an auspicious kite‡ in the sky, and his moonlike face flashed. He uttered the auspicious names Lambodar and Bighnes§ and sallied forth. He fastened on his forehead a fish's tail, and wore a safflower garland, and after saluting Bighnes, the king issued from his palace.

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* White stockings, and a white blaze on the forehead.

† A river about five miles west of Bhawáṛá.

‡ *Chhemankariní*, the Bráhmaní kite or Coromandel eagle, considered as a bird of good omen, *Falco Ponticerianus.*

§ Two names of Ganes, the conqueror of obstacles.

13. *Chhand Tribhangí.*

Indra, the king of heaven ran away in terror, and took shelter on mount Meru. There he extolled mother Durgá, and besought her to save him from his great fear. Who can count the kings of the earth? They were but lords of the poor, and easily submitted to his (Narendra's) authority. By the pride of the dust of his troops the very sun was obscured, and the earth trembled. Who could withstand him. The great warrior of Bíjápur, and the heroic king of Audh, took to penance and so conquered their fears. The Rájás of Huglí and Calcutta gave up their power, and wandered about clothed in rags. The king of the south deserted his arms and presented slaves. The queen of Ḍháká wandered about like a mad woman, and other kings too lost heart. Ḍillí shook, Banáras fled, Betiyá fell down, for who could stand in his way. All feared much when the king of Mithilá, the refuge of the distressed, issued forth.

14. *Dohá.*

The Maháráj, bow in hand, marched from the fort, and encamped in the plain of Hariná.

15. *Chhand Narách.*

Very long tent-walls of cloth upheld the tents set with jewels and thousands of golden wires. In one place stood canopies reaching to the sky, in another were deposited rare kinds of palanquins. Elsewhere were thousands of weapons and litters,* and of horses and elephants. Elsewhere were laid bows and innumerable arrows of excellent quality. Elsewhere were drums of various kinds, while in other places were the brilliant soldiers, conquerors in fight.

16. *Dohá.*

Kabí Lál describes the camp-bazár of the Lord of Mithilá. It appeared four times as extensive as the city of the gods.

17. *Chhand Bhujangaprayát.*

The fountain was laid and a beautiful market established. Thousands of merchants marched in rows. Numerous young damsels sang sweet songs and asked for alms. Here were being sold edible roots,† sugar and bags of salt. He who tasted these, considered thereafter ambrosia sour. There were they preparing sponge-cakes and sweetmeats. Here were fruits in syrup, there were sugarcandy and *jilebis*,‡

* A *lál'kí* or *nál'kí* is the ornamented litter used at a wedding.

† *Kund* is roots like the potatoe, yam, &c., as distinguished from *múl*, which means roots like the turnip, carrot, or radish.

‡ A kind of long hollow tube of flour and sugar, curled into patterns, and filled with syrup.

and many stood bargaining their prices. Here were they selling brown sugar and slabs of molasses, and there were laid cakes prepared in clarified butter. Here were sold embroidered scymitars and swords, and there the jewellers were selling *sikká* gold mohars. Here people were greatly crowded round the store house, and thousands of Kachchhí and Khanhárí horses were being sold; there were infuriated elephants, and many camels. Here were painters standing as they painted pictures, there were laid hundreds of thousands of raisins and dried dates, and in another place fell into the reservoir showers from the fountain. Here were golden threads, and woollen§ double shawls, there were sold necklaces of jewels and pearls. Here were lengths of silken cloth, and coats of muslin whose price no one was able to fix.

18. *Dohá.*

They marched from Rámpaṭí,|| and thence to Achának. There the king heard the beat of kettledrums, and knew that the army of the Governor was very near.

19. *Chhand Bhujangaprayát.*

On both sides the armies were ready, and in the midst was the great river. Thousands of arrows, bows, and cannon balls were discharged, which seemed as if all the stars were falling from heaven at once. The wand-bearers ran up and down quick as the chimes (rung at the end of a watch). The sky was filled up as if with fireworks in the form of flowers. The hunters approached and shot the enemy who lost heart and retired. The wounded were laid on beds (and so thick did they lie) that no one was able to pass by that way.

20. *Dohá.*

The king told the Bakhshí to go up to the battle-field, and to keep all on the alert, for fear the enemy should in the end have recourse to some stratagem. The Bakhshí took Jáfar Khán and Hálá Ráy, beat the bass kettledrum, and entered the battle-field. Some one showed Mahthí the way, and he performed a stratagem, and mounting a conveyance he crossed the river at Gangduár Ghát. Then doubling his pace he arrived at the hamlet of Bishnupúr. The messengers told the king that the armies (*lit.* crowds) had come to close quarters, and the two mighty heroes Mitrajít and Umráo saluted the king and thrust their feet into the stirrup.

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* *Sál báfí* means woven of wool.

† About five miles east of Bhawáṛá.

21. *Chhand Bhujangaprayát.*

The Bais, Bagghel, Bachhbaut, and Hárá* marched down with jewelled swords in their hands. The Hárás shone each a greater hero than the other and on all sides the drums loudly sounded. Thousands, of arrows, bows, and cannon-balls were discharged, but on neither side would the great warriors retreat. Step by step the armies approached each other, and on the festival of the Maháshtamí (the eighth day of the bright half of Ásin, sacred to Durgá) the (final) struggle took place. Countless drums, trumpets, and conches sounded, and, O Rám, a dense, loud, noise arose. Salábati galloped his horse, and Umráo Singh stood up to oppose him. Both were heroes of matchless valour, and the duel between them was like that between Karna and Arjuna. They drew their swords from the scabbards, and struck out fiercely with them, so that they flashed like lightening amidst the dense clouds. In the end Salábati was wounded, and tottered helpless and Umráo seized him, thrust him down and killed him. Bhikhárí saw this and ran up, but could not arrive in time, and only struck at the (elephant's) howdah. The cannon balls began to fall amongst them, and the brave heroes fell, so that dread filled the city of Indra itself (at the sight). Fairies, whose fame had filled the whole earth, then came down with garlands of flowers. Then the great heroes, with thousands and thousands of companions, alighted from their horses.

22. *Chhand Narách.*

They fell, they raised each other, they ran here and there, they fought in single combat like huge elephants wrestling together. King Mitrajít Ráo caught hold of Bakht Singh, who, struck with severe blows, fell down whirling. Words could not be heard for the hissing of the countless arrows, as the nobles fought in different ways. The captains kept causing wounds incessantly, and the arrows despatched from their bows filled the whole space betwixt heaven and earth. As each heard of the defeat of his side, he lost control over himself, when in the struggle the cannons thundered a thousand times. Loud horrible noises arose as shield crashed against shield, and as all around sword clashed against sword. In their rage the heroes shout 'It is well, it is well', and rushed forward to the fight, and in pitched combats ten million heads were severed with long-swords. The headless trunks turned round and fell with a terrible whirl upon the earth. Ah! one beats another down and butchers him. In the battle-field of the Lord of Mithilá, a river flowed here and there, in which the lotuses were represented by handsome heads, the water blood, and the weeds (the corpses') hair. The battle was won, and at the end enjoying the feast on the enemy, ghouls ate and ate the (dead soldiers') heads till they were satiated. Káli herself brought home numerous garlands of human heads, and with huge demons, invested their lord (S'iva) with them. All the (king's army) returned from the battle-field for the general (Bhikhárí) had fled away. The king (of Mithilá) gained the victory, and the drum of his fame resounded.

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* Various Rajpút tribes.

23. *Dohá.*

The king gained the victory, the general fled; and the fame of Tirhut quadrupled. The mother of the universe kept her promise to the Maháráj, and spared only one man—Bhikhárí, on account of his high position.

24. *Chhand Bhujangaprayát.*

All the Ráos and Ránás who remained behind plundered the storehouse, the double-drums and flags. Here they looted palanquins, litters and ten millions of diamonds, and there cartridge boxes filled by special heroes. They plundered tents, tent-walls, camels, and carts. Here and there, some pillaged behind others. They looted spears, elephant-cannons, lances and javelins, and here and there one (quarrelled) with another, and pierced him to the heart. In other places the men of the Bais clan ran over and pillaged horses and elephants. In this way was the government of the Maháráj re-established.*

25. *Dohá.*

When they had finished pillaging they returned besmeared with blood, and Lál, the good poet, says that in this manner Bhikhárí lost the battle.

Two versions of the Song of Gopí Chand.—Edited and translated by G. A. Grierson, C. S.

There is no legend more popular throughout the whole of Northern India, than those of Bharthari and his nephew Gopí Chand. They were two kings who deserted their thrones to become disciples of Gorakhnáth. The story of Gopí Chand has penetrated as far east as even Rangpúr, where it is preserved in the Song of Mánik Chandra.† A Hindí version of the legend can be bought for a few pice in any up-country bazár.‡ The two versions here given in parallel columns were taken down from the mouths of singers in different parts of Bihár. The Bhojpúri version was found in Sháhábád, and the Magahí one in Gayá. They are excellent examples of these two closely related dialects.

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* *Lit.* Cries of alas (from persons seeking justice) were again made to the Maháráj.

† Published in J. A. S. B., Part I, No. 3, 1878.

‡ Gopí Chand Bharthari ká Jog, by Lachhman Dás.

The following is a brief account of the whole tale of Gopí Chand taken from the Gopí Chand Bharthari ká Jog above referred to. The two Bihári versions only contain the latter portion of the legend. Gopí Chand was a king of Dhára. His mother's name was Mainávatí, and her brother was the famous Bharthari, who, after being a king, himself became a disciple of Gorakhnáth and a Jogí. When Gopí Chand grew up and was married, his mother attempted to induce him also to take vows of asceticism. After making various objections he finally consented and went off to look for Gorakhnáth who was his mother's *guru.* On the way he found his mother's brother Bharthari, who at first attempted to turn him from his purpose, but finally took him to Gorakhnáth. The latter also dissuaded, but finding the king persistent ordered him, as a test to go forth as a beggar, and ask for alms from his wife, Queen Ratan Kumári. After wandering through many lands, he reached his palace, and asked for alms. A maid-servant came out but he refused to take anything from her, telling her to go and tell the Queen that he wished to receive alms from her. The Queen came, and also endeavoured to dissuade him from becoming an ascetic, and entreated him to stay with her. He refused. The author then* continues :—

इतनी बात रानी रतन कुमारी की सुन के, गोपी चन्द वहाँ से चल दिये और चले जहाँ मैनावती माता बैठी, जहाँ आय पहुँचे, और माता जी को भली भाँति से प्रनाम किया। तब माता ने भली भाँति से आसीस दीनी। तब माता से आग्या ले कर बाकी समाचार मुख जबानी से बरनन किये। तब माता ने फेर उत्तर दिया कि बेटा सुनो——

अब जवाब माता का गोपी चन्द से।

छन्द कुण्डलिया।

दोहा॥ चार खूट रमते फिरो करो देस की सैर।
बङ्गाले मति जाइयो जो तूँ चाहै खैर॥
काव्य॥ (बेटा जी†) जो तू चाहै खैर तेरि बरजै महतारी।
सुनि गोपी चन्द लाल अरज एक मान हमारी॥

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[*] The metre of the following version is often incorrect in the original, and is given as *dohás* and *chaupáis.* It is really not very correct *kuṇḍaliyá.* The last word of each *kábya* should properly be same as the first word of the preceding *dohá,* but this is not the case.

[†] The words *beṭá jí* &c., do not form part of the metre. Such additional words are known in prosody technically as *jor,* and should be read in a lower tone than the rest of the poem.

(बेटा जी) गुरु से राखो ध्यान रहैगी लाज तुम्हारी ।
दरसन दीजो फेर तेरि सूरति पर वारी ॥ १ ॥
दो० ॥ बङ्गाला कैसा बसै कैसा उस का भेस ।
हम ने तो देखा नहीं राज किये चहुँ देस ॥
का० ॥ (माता जी) राज किये चहुँ देस मुल्क मैं देखे सारे ।
दिल्ली सहर सुथान देखि लिय तख्त तिजारे ॥
(माता जी) दक्खिन औ गुजरात रहे ना हम से न्यारे ।
पूरब पच्छिम देखि लिये सब बलख़ बुखारे ॥ २ ॥
दो० ॥ बचन हमारा मानियो बङ्गाले मति जाय ।
बहिन तेरि चम्पावती देखत हीं मरि जाय ॥
का० ॥ (बेटा जी) देखत हीं मरि जाय।बहिन चम्पा दे तेरी ।
तोहि लागे अपराध करै क्यों ऐसी फेरी ॥
(बेटा जी) चन्दन बिरवा छोड़ पेड़ क्यों बोवै बेरी ।
जनम अकारथ जाय कही तुम मानो मेरी ॥ ३ ॥
दो० ॥ जा दिन से जोगी भये करि करि भगवा भेख ।
घर सोलह सौ नारि है इन में मरी न एक ॥
बहिन मेरी कैसे मरेगी.

The substance of the foregoing (it is too easy to need translation) is that Gopí Chand went to his mother, who warned him in his journeys never to go to Bangál. The king says he has never yet been there, and asks what sort of country it is. He has been all over India, Balkh and Bukhárá, but has never been there. The mother insists on the necessity of his avoiding Bangál, for his sister Champá (or Birná as she is called in the Bihárí versions) lives there, and if she chance to see him wandering as a beggar, she will die of grief. To which he replies, 'when I went first to be an ascetic, I left sixteen hundred wives behind me, and not one of them died. Why then should my sister die?'

In spite of his mother's warning Gopí Chand goes to Bangál, and calls at the palace of his sister Champá for alms. A maid-servant comes out and offers them to him, but he refuses to take them from her, saying he will take them from the hand of Champá and of no one else. She gets angry at this, whereupon he chides her saying 'I bought you and gave you to my sister in her dowry, but now that I have become an ascetic you do not recognize me.' The girl then goes and tells Champá, who comes out and at first refuses to believe that the beggar is her brother. When, however, he proved his identity, by recalling to her particulars of her wedding which none but he could know, she became

convinced, and according to Mainávatí's prophecy fell down dead. Gopí Chand then called on his master Gorakhnáth, who came and restored her to life. This is the end of the usual story. The Magahí version carries the story on a stage further. It adds that Birná (*i. e.* Champá), after coming to life, wept and wept till the earth opened and swallowed her up.

गीत राजा गोपी चन्द।

(Bhojpúrí.)

१। फाड़ के पितम्बर राजा गोपी चन्द गुदड़ी बनावत बाड़े। बीचे लागे हीरा लाल मोती। बन गैलि गुदड़िया अनमोल। पहिर के गुदड़ी राजा रमि के चलत हैँ। माता उन्ह के गुदड़ी ध॰ के ठाढ़े। तोहि देख बेटा बाँधोँ धिरजवा। तूँ तो निकल के बेटा होत बाड़े जोगी। नौ रे महिना बेटा ओदर में रखलोँ, ऐहूँ रे बिपतिया लाल मोरे काम। सात सोत के दुधवा पिआएऊँ। तवना के दमवाँ मोहि दे के जाऊ॥

गैया भैँसिया के दुधवा तूँ पाऊ हटिया बजरिया से किनि के मैं देओँ। बाबा के सगरवा दूध से भराऊँ, तार लेऊ तूँ दुधवा के दाम। तेऊ पर उरिन मँ माँता से नाहिँ। दुधवा तूँ बकसू माँता धरम के पीछे॥ लागू परदेसिया तू रे जोगी। दुधवा

गीत राजा गोपी चन्द।

(Magahí.)

१। पहिरि गुदरी राजा बन चले। माता गुदरी धरि ठाढ़॥ नव महिना बेटा उदर में पाललूँ। दसवाँ में लिएल॰ अवतार। जनम तेँ मरि जैत॰, बेटा, करतूँ सँतोख। इतना न॰ बोल॰ गोपी चन्द कि, जानू, मैआ, जन्म के हम बाँझ ही। जानू हमरा कोख में ढाक मदार जन्मल, इह से अप्पन पापी प्रान के समुझाऊ॥ इतना बोलल मैना माता, बसल बसल नगरी कैल॰ उजाड़। तोहि बिना मँडलिया सून गोपी चन्द। इतना न॰ बोल॰ गोपी चन्द, कहे माता मैना, दूध के दाम देइ लेऊ, तब पाछे फकीर होइ जाऊ॥ इतना सुने गोपी चन्द तब सूझे धरती ऊपर असमान। कउन ऐसन बेटा होअत जे स्वर्ग के तरग गिनत। कउन ऐसन बेटा होअत जे माता के दूध के दाम देत। जोँ मैना माता गाइ के दूध चहितौ, हाट बजार से मँगाय देतूँ। तोहार दूध से आलाचार है तोहार दूध के माइ सारा बदन पालल है, तोहार दूध अनमोल है॥ गाइ भैँस के दूध बेटा नहिँ पिओबी। पिओबी हम स्थन के दूध। दूध के हरावन डाले जोगी। बेटा फकीर न॰ हो। आझ पाव॰ गाढ़ी दीन गाढ़ी रात।

त० बकसोँ बेटा धरम के पीछे। एतनी कहलिया मोर मान लेबे॥

एक दीन बेटा बिपत में काम आवइ। तूँ निकल के, ले, फकीर जोगी मत होअ, एतना न० बोलइ गोपी चन्द॥

२। आन दे मैना माता छूरी कटारी। काट के कलेजी रख देऊँ, तब जोगी फकीर होइ जाऊँ। मैना माता दूध बकसू धर्म के। निहोरे लागे परदेसी तोहार जोगी॥ जियत रह० बेटा, जोगी हो के आइ मिलइ। करि तीरथ बरत होय सवाब॥ मुलाकात बरि दूर गेल माता। एतना न० बोलू, मैना माता, कि हमे बकसलूँ। बकसथुन परमेस्वर जे जन्म कर्म्म देलक॥

३। हाथिन के छोड़े गोपी चन्द। ऊँटन के छोड़े उँटसार। घोड़न के छोड़े घोड़सार। नव सै छोड़े पैठान। पाँच सै रोए कन्या कुमार। नव सै रोए बिहायी। मैना माता रोऐ पटकि सिँघासन। हम्मा चिरइँ रोए कोठा के अटारी। गाँव के रोए रैयत किसान। बाट के रोए बटोही। कूआँ के रोए पनिहारिन। ऐसन ऐसन दुलरुआ निकल के भेलन जोगी॥

४। तीन रे तिरलोकिया में फेरिया लगैहे। बहिन रे बिरनवा का देस मत जैहेँ। मरि जैहेँ बहिनिया तोर, छाती फाटि, जहिया सुनिहे भैया मोर भैल है जोगी॥ बारी सतरनियाँ रे बारे के बियाहल, तवनो गुदड़िया धै के ठाढ़े। तुहुँ तो सामी मोर जोगिया होत बाड़े। कवन रे अलिमियाँ मो के दे के जैबे। पथल के मुरतिया तो होत गोपी चन्दा। भवँरा भेलसवे उड़ि गैले॥

५। पहिले बसेड़ देखा कदली का बनवाँ। जँगली हरिनियाँ देख रोए। जङ्गल के मेवात तुर के खियावे। खा ले रे जोगिया मोर जङ्गल के मेवातु॥ अनवाँ न० खाबोँ माता, पिअबोँ न० पनियाँ। बिरना सहर मोहि देहु बताइ॥ एतना बचनियाँ सुनि, बोले बनसपति, छवे रे महिना के रहिया बिरना सहरवा। मरि जैबे अनवाँ बिन पानी। अड़बड़ रहतवा तोर

४। एतना बोलल मैना माता, सुन० बेटा हम्मर बात। तीन मुलुक भिच्छा माँग० बहिनी के देस मत जाऊ॥ भला तो कैलू माइ, चेतौलू चेताइ। भूलल बहिनी देलू समुझाइ॥ रोअत बहिनी तोहार छव मास। तेहू बहिनी के नैहर के आस॥

५। पहिला मजिल कैलन गोपी चन्द। कदली जङ्गल में परि गेल। साँझ बन के रोए बनसपति माइ। जङ्गल के रोए हरिन। हरिन के रोअले जङ्गल के पात खहराय। सूरत सकल देखि के आधी रात पछली पहर खोल के बजावे बनसपति। बनसपति के दया लागि जाय। बड़े बड़े सेर बड़े बड़े सिङ्घ मार के खाइ जैहे। बहिनी से मुलाकात नहिँ होय॥ गोपी चन्द

बिरना सहरवा॥ मौँता मोर मिनतिया तो मान लेबे। तो केतने दिनवें में पहुँचे, मोर मौँता, ओ ही तरे हमरा के देहु पहुँचाइ॥ चिल्हिया सरूप होत बनसपति, तोतवा सरूप लेत बैठाइ। बिरना सहरवा में देले पहुँचाइ॥

६। गलिया के गलिया बिरना फेरिया लगावे। जीअ मोर नगरिया के दाता लोग। राजन घरवा के दुअरा बतावहु। तोहरे सरतियाँ में छाड़ देबौँ॥

ऊँच रे अटरिया नीच है दुअरिया। दुअरवे पर उकठल चनन के पेड़। उहे हवे रजवा घर के दुआर॥

७। ओहि तर जाइ जोगी धुँइयाँ लगावे। फूल के चननवा भैल कचनार। उपरा से ताकत बाड़ी बहिनी उन्ह के बिरना। ऐसन जोगी तपसी मैँ नाहिँ देखलौँ॥ जलदी बोलावत बाड़ी मुँगिया लौँड़िया। आउ लौँड़ी उन्ह कर जतिया तैँ पुछू॥ हयदा त॰ जोड़ जोगी अरज लगावत बाड़े। लौँड़ी, मोर कहलकी तैँ मान ले। छतिरी मोरे जतिया। तैँ आ के बतैहे। कहिहे जनमवाँ के सिध हवे जोगी॥ जतिया छिपौल॰, तो भल कैल॰।

बोलल, चाहे मरौँ, चाहे जीऔँ, जाएब बहिनी देस॥ बनसपति के दया लागल। गोपी चन्द के तोता बनौली, अपने हन्स चिरईं बनि जाय। घड़ी पहर में गोपी चन्द बहिनी के देस में उतार देलक॥

६। बहिनी के देस में गोपी चन्द पहुँचल। मुँह खाक से भभूती लगाइं गुदरी से देह छिपाइ गली गली फीरे गोपी चन्द। सभ के दोआर चन्दन के पेड़, न॰ राजा के दोआर चीन्हल न॰ परजा के, सभ के दरवाजा फेरी लगौलक॥

नगरी के लोग कहलन, बाबा टीक॰। खाइ खबर सभ केऊ लेत॥ गोपी चन्द बोलल कि हे गाँव के बहिनी माइ। राजा के दोआर हमरा बताइ देऊ। राजा के दोआर टीकब। परजा के दोआर नहिँ टीकब॥ नगर के माइ. बहिनी बोललन, ऊँची अटारी नीची दुआर। सोना के चौकठ रूपे केवाड़। औरा भौरा दो हाथिन। बारह बरस के सूखल चन्दन॥

७। गोपी चन्द चलि भेल बहिनीक दुआर। सूखल चन्दन तरे धूँईं देल जमाइ। बारह बरिस के सूखल चन्दन भेल कचनार॥ देखे नगर के राजा परजा लोग। जोगी ना है। केऊ है भगवान। सूखल चन्दन बारह बरस के भेल कचनार॥ मूँगा लौँड़ी बोलली। सूखल सूखल चन्दन खातिर बरहमन खिलाऊँ। सूखल चन्दन होए कचनार। जोगी एक अनूप आएल॥ चार सखि आगे चार पाछे बीच में बहिनी उन्ह के चललन। खिरकी पल्ली खोलि देलन। एक नजर जोगी के ऊपर एक नजर चन्दन के पेड़ तर। सूखल चन्दन रानी देखे कचनार, रानी गिरल मुरझाइ॥

८। बाबा भोजन कै खबरिया त॰ ह॰ ना बताइ। कि खैब॰ राजन घर कै रसुइया, कि करब॰ दुधवा कै फरहार॥ बारह बरिस भैल, रे लौँड़ी, कहियो हथवा हम नाहिँ जारल। हम त॰ खैबोँ राजन घर कै रसोइ। तवन आवे बराम्हन बरुआ कै हाथे। लौँड़ी कै कुअलकां ऊहो ना खैबोँ। छतिरी धरम मोर जाई नसाइ। नई रे बिपतिया राम मोर डालल। लिखल करमवाँ कै भैलीँ जोगी॥

८। का जोगी भोजन करिह॰। का करिह॰ अहार। कि राजा रसोइया जेमावत॥ गोपी चन्द बोलल, नई बिपत नरायन देलन। धूँआँ देखि नैना से आँसू ढरे। आग देखि देहो में फोला पड़ि जाय। कह देह राजन कै बरहमन कै हाथ जेवनार बनाव॰, तब तो खाएब॥

९। एतना बचनिया सोनि कै लौँड़ी त॰ गैली, भोजन कै खबरिया त॰ भोलि गैली लौँड़ी। भोलि गैली इहल टिकुरा। भोजन कै खबरिया तो केऊ ना लेल। आधी त॰ राति जोगी बन्सी बजावे। बहिनी रे बिरनवाँ कै सबद परले॥

९। मूँगा लौँड़ी भूलि गेल अपना पञ्ची में। रानी भूलि गेल पाट सिँगार। बरुआ बरहमन भूलि गेल अपना भङ्ग में। आधी रात पहिले पहर बीत गेल। केऊ खाएब कै खबर नहीँ लेलन। एतना में गोपी चन्द मुरली बजाइ, हम्मर बहिनी खात पीत होअत, तो सत कै सवाइ बढ़ि जाय। खाय बहिनी बिसरल होअत। जेतना भण्डार में रहे सभ जरि जाएत। नवठी पात पुराव॰ न॰ खाय न॰ हम्मर धरम जाएत॥ एतना में सुनली बहिनी मुरली कै सबद॥

१०। जलदी बोलावे रानी मुँगिया लौँड़ी। एकं जोगी दुअरा पर करत बा उपास। जलदी बोलाऊ लौँड़ी बराम्हन छोकड़वा। कहहु रे जेवना कै कुसलात॥ जा कै त॰ लौँड़ी बराम्हन कै बोलावे। छतिस तौलिया में छतिसो परकार। एको में खाली ना। अबहीँ चाह॰ बराम्हन से कुँअरा खियाव॰। एक जोगी दुआरू पर कवन बिसात॥

१०। मूँगा लौँड़ी, सभ खाय हमरा नगरी में। जोगी उपास परे। मूँगा लौँड़ी कहली, हम का जानी। बरुआ बरहमन के बोलाइ भेजल। बरुआ बरहमन के बोललन, कि जलदी रसोइ दे आवहु जोगी कै। बरुआ बोलल कि एक जोगी के कौन बिसात है। छप्पन सौ कूँअर जेँवा देऊँ॥

११। गोड़वा त॰ धोइ बराम्हन खोलल बा भण्डार। सारी रे तौलिया

११। सोना कै खड़ौआँ पर होए असवार। जाइ कै खोलि भण्डार। देखे

जर के खँगार। मनवाँ मैँ सोचत बाड़े बराम्हन के छोकड़वा, कवन रे अपन्हो होइ गैले। ओहि रे तौलिया के जरी करौँदी मुँगिया लौँड़िया से देला भेजाइ। राजन घरवा के नैँयाँ छिपैहै। कहिहै मोर गरिबवा घर के रसोइ॥ मुँगिया लौँड़ी रे ले के तो गैली। जोगी तोर करमवाँ मैँ आगि लागे। जरि गैले मोर राजन घर के रसोइ॥

तो छप्पन तौली मैँ आग लागल। छप्पन तौल। गराव॰ तो मूठी भर करौनी निकसल। बरुआ बरहमन बोलल कि मूँगा लौँड़ी जोगी के रसोईं दे आव॰॥ जात के जुठाही मूँगा, बात के होसियार। गरी, बदाम, छोहाड़ा, मोनक्का, पाँच खिल्ली पान लगा देथ। सोना के थाल मैँ मूँगा लौँड़ी धर लेल॰ दही करौनी कटोरा मैँ। ले गङ्गा जल पानी

मूँगा लौँड़ी चललन। ले बाबा जोगी रसोइ। तोहरा करम मैँ आग लागे॥ कोपकाप करि अँधिआरी। उठि गोपी चन्द अकुताइ। सोना के तुमड़ी ले पानी। सोना के कटोरा मैँ ले रसोइ।

१२। एतना बचन सुनि जोगिया त॰ हँसे। चमकत बा बतिसिया रे मुख के दाँत। ओहि रे उजिअरवा मैँ लेत बा करौँदी। का दिहली बहिन हमार॥ ओहि रे करौँदी राजा खुँटवा गठियावे। खात बाटे धुँइयाँ के खाक भभूति॥

१३। होत रे फजिरवा त॰ लोहिया लागे। बहिन के सगरवे पर करे असनान। सारी रे बदनियाँ त॰ गुदड़ी छपावे। मुँहवा के सुरतिया तो नाहिँ रे छपे। सानि के भभुतिया तो भसम चढ़ावे। बहिन के दुअरवे पर ठाढ़ बाड़े। हथवा त॰ जोर जोगी अरज लगावे। हमरो त॰ भिछवा रानी देबे तोहरो दुअरवा हम छोड़ देबोँ॥

१२। कोपकाप के अँधिआरियाँ अपने रसोइ देखे के गोपी चन्द हँस देत। रात हलै, त॰ दीन हो गेलइ। चदरी खोलि गेठिया लेलक रसोइआ जलल करौनी। गोपी चन्द धूनी काढ़ के राखि सानत होइ। पाँच पतरी पर रख देलक। पाँचो परकार बनि गेल॥

१३। होत फजिर जाए पोखरा पर असनान करे। सभ देह गुदरी से छिपाय, औ मुँह खाक भभूती लगाय। हमरा बहिनो न॰ चीन्हे। जोगी फकीर होइ जाऊँ॥ का गोपी चन्दा दाँत के बतीसी चमके। का गोपी चन्दा रे छवे। एक बरन के गोपी चन्दा हलै, औ आठ बरन सूरत बढ़े॥ होत फजिर जाए बहिनी के दुआर। भिच्छा माँगे। जीए बहिनी बबा सुखदाय तोहार॥

१४। गुदड़ी बस्तर मूँगा लौँड़ी नेहार, देखि जोगी के सकल सूरत, गावल जाय रङ्ग महलोँ मैँ। मूँगा लौँड़ी कहलन कि, हे बहिनी, जउन रङ्ग के गोपी चन्दा भाइ छोड़े, तउन रङ्ग के जोगी चन्दा बाबा॥ मूँगा लौँड़ी तोर भाइ भतीजा खाऊँ। हम्मर भाइ गोपी चन्दा जोँ आवत तो उजरैया बसे जाय।

नौ से घोड़ा, नौ से हाथी, नौ से मोगल पैठान, नौ से कूँअर पैठान ॥ मूँगा लौंड़ी बोलल, त॰ चलबू देखे, दमरी दोकरा माउर खाय मरि जाय ॥ इतना सुनत बहिनी बिरना, जात के नोची, जात जुठाली मूँगा लौंड़ी। आज नहिँ हम चलबूँ, दमरी के माउर ले के खाय मरि जाय। हमरा ऊपर अपराध चढ़े ॥ बाबा के हाथ के अँगुठी, औ महतारी के चिट सारी, औ भौजी के हाथ के कङ्गन, चार सखि आगे चार पाछे, सोनन के थाल में भीख लेले। ले, बाबा जोगी, छाड़॰ दुआर ॥

१५। कङ्कड़॰ पथल छाड़लूँ माता के महल में। इह कङ्कड़ पथल ले के हम का करब ॥ बहिनी बोलली, सोना चाँदी भिच्छा देत हिअउ, कङ्कड़ पथल बनाइ देलकै ॥ जौँ कउनो साल दोसाला देतू तो गुदरिया बनाय देतूँ ॥ जोगी बाबा लेत नहिँ, ऐसी गाढ़ी कसम खा जाय। जोगी बाबा हम्मर दुआर छोड़ देहू। तोहरा जोग कपड़ा नहिँ है ॥

सोनवाँ रुपवा के खिचड़ी बनावत बाड़ी। चलत बाड़ी भैया के भिच्छा देवे। मुँगिया लौंड़िया से देली भेजाइ। जोगी आपन भिछवा ले, तूँ लेबे ॥

१५। इथवा त॰ जोर जोगी अरज लगावत बाड़े। कङ्कड़ पथरवा बहिन के रे चलावे। हम के देतू गुदड़ी के कपड़ा पुरान ॥ रहेला कपड़ा मोरी चेरिया लौंड़िया। फारे खातिर नाहिँ बाटे मोर कपड़ा पुरान। अपने मैं भैया के लाख से दोहाइ। नाहिँ बाटे कपड़ा पुरान ॥ इतना बचनिया त॰ बहिन उन्ह के बोले। मरे तोरे भैया रे राजा गोपी चन्दा। झूठे रे किरियवा तूँ काहे के खाइउ ॥ दे के सरपवा त॰ जोगी रम चलत बाड़े। बहिन उन्ह के गुदड़ी धै बिलमावे। फाड़ि के पितम्मर जोगी गुदड़ी बना देबौँ। काहे मोरा भैया के देऊ सराप। अपने गुरुअवा के लाख से दोहाइ। अपने त॰ मतवा के दूध हराम। काहे मोरा भैया के दिहल॰ सराप ॥

१६। इथवा त॰ जोड़ जोगी पता आपन बतलावत बाड़े। बङ्गा संहरवा राजा रघुबन्सी। बाबा रे तिरलोकी सिङ्घ के मैं नाती। बाबा रे भवन्दा सिङ्घ के मैं बेटा। आँधरी बहिनियाँ मैं तोर सग भैया। बड़ी तूँ सँपतिया पर गैलू आँधराय। ना चिन्हलू उदरी इक भाइ ॥

१६। सुनि इतना बोलल गोपी चन्द, पाय धन गैलू उधराय। नहिँ चिन्हलू. कोखिया के सङ्ग भाइ ॥ इतना सुन गोपी चन्द बोलल, हम नैहर के नाते तोहर भाइ. ॥

१७। इतना बचन सुनि बहिन उन्ह के बोलत बा, सुन रे लौंड़िया मोरि बात। इह मोर भैया जोग नाहिँ बाड़े। बारह से कुँअरवा मोरा देवढ़ी पर

नोकर। ओहि कुँअरवा मेँ से जोगिया बाटे। आनत बाड़े मोर भाइ बाप के नाम। जहिया मोरे ऐते भैया गोपी चन्दा, चार सै त० घोड़ा ऐते ताजी और तुरकी। हथियन से हलफा उठि जैते। पैदल के गिनितिया कवन रे चलावे। उजरी नगरिया बस जैते, जहिया ऐते भैया मोर गोपी चन्दा।

हमरा भैया के हथवा मेँ कलम के चिन्हवाँ। का मोरे भैया रे तिलक चढ़ाय। का मोरे भैया दिहले दहेज॥

१७। जब जानूँ के हम्मर भाइ हो, कि बियाह जे मिलल हमरा से रे तूँ बताइ॥

लाख सै असरफी, रे बहिन, तिलक चढ़ाएऊँ। भँवरा हथिया दोअरा का पूजा। गाड़ी छकड़वा दिहले लदाइ सोनवाँ। कँसहँड़ के गिनती कवन चलावे। रुपिया पर कलम न० चलाएऊँ। बजु के कँगनवाँ तोरे हथवा बिराजे। बाबा के मुँदरिया तोरा हथवा मेँ चमके। पहिरले बाड़िस नैहर के चित रङ्ग सारी॥

गोपी चन्द बोलल कि देखऽ बाबा के हाथ के अँगूठी सोभे। माता के चिटसार, भौजी के हाथ के कङ्गन॥

१८। एतना सुनि बहिनी बिरना घर के गुदरी लागे रोए। माय बिरोगिन, भाइ जोगिया आज। बैस० बैस० भैया पाट के सिँघासन। दुनियाँ दौलत देऊँ मँगाय॥

१८। एतना बचनिया सुनि के बहिन उन्ह के दौड़ल जैसे टूटे गैया के कोर बाछा। भाइ रे बहिनियाँ त० भेँटे लागे। जङ्गल के पतवा त० गैले खहराय। कै के जेवनवाँ मेँ भैया के खियाओँ। पाछे पूछोँ नैहर कुसलात। 'किह० भैया चढ़ि आइल सुबवा नवाब। के तोर देसवा रे छोर लेले। इहाँ मेँ भेजोँ भैया जोरि फौदिया। तोहार देसवा लेऊँ छोड़ाइ॥ नाहिँ बहिन चढ़े कोऊ सुबवा नवाब। नाहिँ कोऊ मोर देसवा हरँ लेले। लिखल करमवाँ के भैलें जोगी। तोरा हथवा के, बहिन, जेवना नाहिँ खैबोँ। एहि घड़ी मोर हथवा कूँक बाटे। रात के रसोइया त० देखु, बहिन बिरना। का दिहलू बहिन। जरि रे करमवाँ। खोरिया के टुकड़ा मोहि अँखिया देखैलू। उतरल नगरिया के रे भार॥ खोलि के करौनी जोगिया देखैले। मरि गैली बहिनियाँ छाती फाट।

तोहरा दरवाजा बहिनी का करूँ। दो चार पैसा होइत, चूरी पहिरे के देइत। एतना मेँ बोल सास नुनन्द। रात मूँगा के हाथ के रसोइ कूअल खैल०। एतनी बेर चीन्ह पहचान भेल, ठनगन करत है॥ एतना सुनि बहिनी बिरना, कउन कउन बीँजन, कउन कउन परकार खाय। चदरी के खूँट मेँ जलल करौनी बहिनी देखिस। हाथ मारि के बहिनी गेल मर।

१९। मनवाँ मैं सोचत बाड़े राजा गोपी चन्दा माँता के कइलिया साँच मैली॥ कमर से निकाले राजा छुड़िया कटरिया। अपना गरदनवाँ पर देत बा चलाइ। ऊपर त॰ गोसैंयाँ रे ध॰ त॰ लिहले। काहे के मारे जोगी अपन जियरवा। तोहरा अँगुरिया मैं अमिरित धरवाँ। चीर के अँगुरिया बहिन के पियाए। जोगी रम के चल देले॥ इति॥

१९। मारौं छूरी कटारी। भाइ बहिनी के जगह मर जाऊँ॥ आय करि के नरायन बरहमन के रूप धरि पकड़ लिहलन। अरे पापी, कनगुरिया मैं अमरित फल है। ओहि बहिनी के देहु पियाय। मूअल बहिनी तोर जी जाय। आप भौंरा के स्वरूप धरि जोगी फकीर होइ रह॰॥

२०। बहिनी उठि बैठल। गली के गली रोएं। चन्दन के पेड़ धरि रोए। चन्दन के पेड़ जबाब कैलक, तुम का रोऊ। तोहार भाइ जोगी होइ गेल। एतना मैं बहिनी हाय करे। फाटे धरती जाय समाय। भाइ बहिनी के नाता दुनो जने के टूट गेल॥ इति॥

TRANSLATION.

Song of Gopí Chand,—Bhojpúrí.

1. King Gopí Chand teareth up his royal robes and maketh out of it an ascetic's cloth. In its midst are fastened diamonds, rubies and pearls, and it was made a priceless cloth. He putteth on the cloth and starteth on his wanderings,* and his mother catcheth him by the cloth and standeth. 'When I see thee, my son, I control myself, for thou art going forth and becoming an ascetic. I held thee, my son, for nine months in my womb, thinking that my darling would be a help to me in trouble. I gave thee seven streams of milk to drink, pay me back the price thereof.'†

Song of Gopí Chand,—Magahí.

1. The king donneth an ascetic's cloth, and starteth for the forest. His mother catcheth him by the cloth and standeth, saying, 'I held thee for nine months in my womb, and in the tenth didst thou take human form. If thou hadst died in thy birth, I would have been contented. Say not, O Gopí Chand, "Imagine, mother, that thou art barren or that thy womb hath borne only a *ḍhák (butea frondosa)* or a *madár (asclepias gigantea)*.* With such words remonstrate with thy sinful soul."' So much said his mother Mainá. (Again she said) '(By thy going away) thou art laying waste an inhabited city, for without thee, Gopí Chand, the whole

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* √ रम to go, wander.

† पियाएँ is 1st sing. of 2nd pret. In p. 39 of my Bh. Gram. I have marked it as wanting.

* Two trees. The first is good for nothing but firewood, and the second is very bitter.

palace is empty. Say not so, Gopí Chand,' saith his mother Mainá. 'First pay me the price of my milk and then go and become an ascetic.' When Gopí Chand heard this, he gazed upon the earth and upon the sky above. 'What sort of son is that, who can count the stars of heaven? He alone can pay his mother the price of her milk.

'If thou desire milk of cow or buffalo, I will buy it in the market and give it to thee. I will fill my father's tank with it, and with it wilt thou recover* the price of the milk. Even if I gave all this I would not be free from the debt. Do thou, O mother, give me a free gift of the milk, for the sake of virtue (*i. e.*, as a free gift).'

'Thou appearest, O my ascetic, to me, as amongst men of another land. I give thee, O son, the milk as a free gift, but mark this much of my words.

If, mother, thou hadst desired cow's milk, I could have bought it in the market, and given it to thee. But for thy milk I am without resource. Mother, my whole body hath been nourished by thy milk. Thy milk is beyond price.' His mother answered, 'It was not the milk of cow or buffalo that I gave thee to drink, 'twas the milk of my bosom. Thou art forgetting* the milk. Be not an ascetic. Protect me in days and nights of trouble (*lit.* on thick days and nights).' Some day O my son, be a help to me in calamity. So, go not forth to become an ascetic. Say not so, Gopí Chand.'

2. 'Bring hither, mother Mainá, sword and dagger, that I may plant them in my liver. Or else let me go forth to be an ascetic. Give me, mother, thy milk as a free gift. Thine own ascetic of a foreign land beginneth to entreat thee.' His mother replied, 'Live my son and be an ascetic. Go thou forth, but come back to me. Great is the spiritual reward of visiting holy places and performing vows.' 'Mother, the day of meeting me again is gone far off. Say not, mother "It is I who have given the free gift." It is God who giveth me my birth, and decideth my fate.'

3. Gopí Chand leaveth his elephants. He leaveth his camels in the camel-stables, and his horses in the horse-stables. Nine hundred Paiṭhán attendants doth he leave behind. Five hundred damsels and princes weep for him. Nine hundred wedded wives weep for him. His mother Mainá dasheth down the throne and weepeth for him. The swans weep on the turrets of his house; in the villages weep the cultivators; on the way, the wayfarers; and by the well, the girls

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* मार लेब, to recover, cf. मार गैलं, it has not been lost. So also √ मर, to be found, recovered.

* बिसराबब = भुलाबब.

who came to fetch water. 'So beloved is he of us who goeth forth as an ascetic.'

4. Thou wilt have to wander through the three worlds, but go not to the land of thy sister Birná. The heart of thy sister will burst and she will die when she heareth that her brother hath become an ascetic.'

Young Satraniyá whom he had married in his youth, she also catcheth him by the cloth and standeth. 'Thou, my husband, art becoming an ascetic, what support wilt thou give me before thou goest.'* Gopí Chand (refused to hear her and) became like an image of stone.†

5. His first halting place‡ was in the plantain-forest and the does of the forest as they see him, weep. (Banspatí, the Egeria of the forest) plucked and offered him fruits of the forest to eat. 'Eat O ascetic, the fruit of my forest.' 'I will not eat food, O mother, nor will I drink water. Tell me where is Birná's city.' When she heard these words Banspatí said 'Birná's

4. Then said his mother Mainá 'Hear, my son, my words. Throughout the three worlds may'st thou ask for alms, but go not thou to the land of thy sister.' 'Well hast thou done, O mother, to remind me. Thou hast caused me to remember my forgotten sister.' 'Thy sister hath been weeping for these six months, for all her hopes are fixed upon her parent's house.'

5. Gopí Chand's first stage fell in the Plantain forest. At even mother Banspatí of the wood weepeth. The does of the forest wept, and as they heard it the leaves of the forest fell down. When she saw his form and appearance Banspatí opened (her flute) and played in the second watch after midnight. She felt pity for him. 'Great tigers and

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* अलमियां = अलम or आलम्ब a support.

† √ भेलस means to settle upon, but the sentence in which भेलसेव occurs is quite unintelligible. The words are written exactly as the singer gave them, but even he did not know their meaning. The sentence might perhaps mean 'The bee (*i. e.* Gopí Chand) immediately on settling flew away,' as if he was only paying a short visit to his home. A reference to the introduction will show that this was the case.

‡ बसेर is literally 'a roosting place.'

city is six months' journey distant. Thou wilt die without food and water. The path to thy sister Birná is rough.' 'O mother, hear my prayer. In as many days as thou dost arrive there, my mother, in so many cause me also to arrive.' Banspatí taketh the form of a hawk, and uplifting him in the shape of a parrot, carrieth him to Birná's city.

6. He began his perambulation of the lanes, crying, 'May ye live, my charitable folk of the city. Show me the way to your king's doorway, then will I leave your company.'*

'The turret is high, and the door is low. At the door is a dried up sandal tree. That is the king's doorway.'

7. The ascetic went before the sandal tree and lighteth his fire,† and, lo, the sandal tree flowered became fresh and green. From above his sister Birná is watching him, saying, 'I never saw a reverend ascetic like this before.' Quickly she calleth Mūgiyá her

lions will devour him, before he seeth (*i. e.*, if he trieth to see) his sister.' Said Gopí Chand, 'Let me die, or let me live, I will go to my sister's land.' Banspatí took pity on him. She turned Gopí Chand into a parrot, and herself into a swan, and in an hour and a watch set him down in his sister's land.

6. When Gopí Chand arrived at his sister's country, he applied ashes and burnt cowdung to his face, and hid his body beneath his ascetic's mantle. Through all the lanes went he backwards and forwards, and he found a sandal tree at the door of every one. He could not distinguish the doorway of the king from that of his subjects, though he went round them all. The village people said, 'Reverend Sir, stay with us. Every one of us will look after thy food.' But Gopí Chand said, 'O sisters and mothers of the village, show me the doorway of the king, for there will I stay. I cannot stay at the doorway of any of his subjects.' The sisters and mothers of the village replied. 'The turret is high, and the door is low. The doorposts are of gold, and the doors of silver. There are there two she-elephants named Aurá and Bhaurá, and a sandal tree which hath been withered for twelve years.'

7. So Gopí Chand went to his sister's door, and lit his ascetic's fire below it, and the sandal tree which had been withered for twelve years became fresh and green. The king and the subjects of the village saw this. 'It is not a mere ascetic. This is some God;

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* सरनियाँ *lit.* protection.

† धूँई, an ascetic's fire.

maid-servant, 'Go my damsel, and ask his caste.' With folded hands the ascetic saith to her, 'Damsel, believe what I say. I am by caste a Chhatirí. Go thou and tell her that, and say "from his birth he hath been an ascetic of the highest degree *(siddha)*."' The damsel said 'Thou hast hidden thy caste, and hast done well.

for, lo, the sandal tree which hath been withered for twelve years hath become fresh and green' Mũ'gá (his sister's servant) said 'for the sake of the withered, withered, sandal tree, will I give the Bráhman food. The withered sandal hath become fresh and green. This is a wondrous ascetic.' With four companions in front of her, and four behind her, in the midst came his sister. She opened the doors of the window and beheld. One glance fell upon the ascetic, and the other on the sandal tree. The queen saw the withered sandal tree fresh and green, and fell in a faint.

8. Reverend sir; tell me what thou wantest to eat. Wilt thou eat cooked food of the king's house, or wilt thou eat milk and fruit ?[*] 'For twelve years, O damsel, I have never burnt my hands (by cooking). I will eat cooked food of the king's house, if it come in the hand of the Bráhman Baruá, nor also will I eat that which hath been touched by a maid-servant. My virtue as a Chhatirí would be destroyed. New troubles hath Rám given me. It was written in my fate that I should be an ascetic.'

8. The damsel Mũ'gá came to ask him, 'O ascetic, what wilt thou eat? Of what food wilt thou partake, wilt thou eat of the Rájá's food?' Gopí Chand replied, 'A new calamity hath God granted to me. As I watch the smoke, the tears flow from mine eyes. As I see the fire, blisters are rising on my body. Tell the king's Bráhman to offer me food, and then will I eat.'

9. When she heard[†] these words the damsel went to give notice about the food, but she forgat.[‡] She forgat also the other menial services, and no one paid attention to the food. At midnight the ascetic played his flute,

9. But the damsel Mũ'gá forgat to send the food amongst her other duties, and the Queen forgat to do so in her dressing and adorning of herself. Barú the Bráhman also forgat, as he ate his *bhang*. After a watch after midnight no one

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[*] फरहार, The meal of an ascetic who will not eat corn,—only fruit.

[†] सौनि = सुन कर के.

[‡] भोली = भुल गई.

and the sound fell upon (the ear) of his sister Birná.

took care concerning his food. In the meantime Gopí Chand played upon his flute. 'My sister hath, of surety, eaten and drunk. May my virtue increase by a fourth (if she hath not). She hath, of a surety eaten her meal and forgotten me. May all the food that is in the larder be burned to ashes. Then, even if she fill nine dishes, I will neither eat it, nor will my cáste be affected (by accepting food from a maid-servant).' In the meantime his sister heard the sound of the flute.

10. Quickly she calls the damsel Mũgiyá saying 'An ascetic is fasting at the door. Quickly, O damsel, call the Bráhman boy, and tell him the state of affairs about the food.'* The damsel goeth and calleth the Bráhman. There were thirty-six dishes of thirty-six kinds (of food), not one was empty. She said, 'if thou desire, O Bráhman, thou canst feed a hundred princes. What difficulty is there about one ascetic?'

11. The Bráhman washed his feet, and opened the larder, and, lo, all the food in the dishes was burnt to ashes.† The Bráhman boy thinketh in his mind, 'what a wonderful thing is this that hath come to pass.' By the damsel Mũgiyá he sent the burnt food‡ of those dishes saying, 'conceal the name of the king's palace. Say "it is the food of my poor hovel."' The damsel Mũgiyá took it away, saying, 'Ascetic, may fire seize thy luck. The food of the house of my king is burnt up.'

10. 'O Mũ'gá, all in my village have eaten, and the ascetic is fasting.' Saith the damsel Mũ'gá, 'what do I know?' She sent for Baruá the Bráhman and said to him, 'serve the food quickly to the ascetic.' Saith Baruá, 'what difficulty is there about one ascetic? I can feed fifty-six hundred princes.'

11. He putteth on sandals of gold, and goeth and openeth the larder, and seeth that fire hath consumed the contents of the fifty-six dishes. If you were to squeeze out the contents of the fifty-six dishes, then only a fistful of burnt food would come out. Saith Baruá the Bráhman, 'O Mũ'gá, give the ascetic his food.' Mũ'gá was by caste an eater of broken food, but in her language she was intelligent. So she arrangeth cocoa-nuts, almonds, dates, raisins, and five

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* जेवन = जेवनार.

† खँगार, ashes.

‡ करौंदी = खँखोरी, the latter is the B. word. It means burnt food of any kind adhering to the bottom of a dish.

packets of betel. She placed them on a golden dish, and tyre and the burnt food in a saucer, and taking Ganges water started. 'Take, O reverend ascetic, this food. May fire seize your luck.' The night was pitch dark. Up rose Gopí Chand in distress of mind. In a golden gourd he took the water, and in the golden saucer the food.

12. When the ascetic heard the words of the damsel, he laughed, and the thirty-two teeth of his mouth gleamed. By their light he taketh the burnt food, saying, 'what hath my sister given me?' The king (*i. e.*, the ascetic) tieth up the burnt food in the corner of his garment, and eateth the ashes and dust of his fire.

13. Morning cometh, and the dawn beginneth. He batheth in his sister's tank. His cloth covereth the whole of his body, but the features of his face were not hidden. He mixeth ashes with water, applieth them (to his face), and standeth at his sister's doorway. He foldeth his hands and maketh supplication, 'O queen, give me alms. Then will I leave thy door.'

12. The night was pitch dark and in order to see his food Gopí Chand smiled. It was night but thereby (through the flashing of his teeth) it became day. He opened his sheet and tied up the burnt food in his knot. He drew towards him his fire and mixed the ashes with water. He laid them upon five leaves, and behold it became the five different sorts (of food).

13. As morning cometh he batheth in the tank. He hideth his body under his garment, and applieth ashes and burnt cowdung to his face, that his sister should not recognize him, and that he might become as an ascetic. How the thirty-two teeth of Gopí Chand shine! How Gopí Chand deceiveth her! He had been all of one (dull grey) colour, but now (after bathing) his form became of eight colours. As the sun rose he went to his sister's door, and asked for alms. 'May my sister's children live long, and cause her to be happy.'

14. The damsel Mũ'gá gazed at his garments, and seeing the form and appearance of the ascetic went singing into the inner apartments. Saith she, 'O sister, as was thy brother Gopí Chand whom thou didst leave at home, such is the reverend ascetic.' 'Mũ'gá; may I eat up thy brother and nephew! *(a form of abuse)*. If it were my brother Gopí Chand who had come, then desolation itself would have been populated (with the crowd of his followers). (He would have taken with him) nine hundred horses, nine hundred elephants, nine hundred Mughal Paiṭháns, and nine hundred Paiṭhán princes.' Said the damsel Mũ'gá, 'if thou wilt not come with me

to see, I will buy a *damrí* or a *dokrí** of poison and eat it and die.' (Saith sister Birná to herself) 'of low caste is she, and by caste an eater of broken food. If I go not at once, she will take a *damrí* of poison and die, and I will be guilty of a sin.' So she put on her father's ring, her mother's painted scarf, and her sister-in-law's bracelet.

Four companions went before her and four behind her. She took alms in a golden plate. 'Take, O Reverend ascetic, (these alms), and leave my door.'

15. 'I left all such pebbles and stones behind in my mother's house. If I take these pebbles and stones what can I do with them?' The sister replied 'I am offering him alms of gold and silver, and, lo, he hath turned them into pebbles and stones.' 'If thou hadst a shawl or double-shawl out of which I might make an ascetic's garment (I might take it.)' 'The reverend ascetic will take nothing. Take not so terrible a resolution (*literally* oath). O leave my door. I have no cloth worthy of thee.'

She maketh a mixture* of gold and silver, and goeth to give her brother alms. She sent it by the damsel Mũgiyá, saying 'Ascetic, take thine alms.'

15. The ascetic with folded hands maketh supplication. 'O sister, who careth for pebbles and stones (like these jewels which thou dost offer me). Hadst thou given me old clothes, for me to make a beggar's cloth of, (it would have been better, what can I do with money?).' 'My maid-servants and damsels get my old clothes. I have no clothes old enough to tear. I swear a hundred hundred thousand times by my brother that I have no old clothes.' When his sister said this to him, he answered, 'may thy brother king Gopí Chand die. Why art thou† taking a false oath?' As he gave this curse the ascetic moved away, but his sister caught him by the cloth and detained him. 'I will tear my royal robes and give thee a cloth. Why dost thou curse my brother. I call upon thy Guru a hundred hundred thousand times. Mayst thou be ashamed of having drunk thy mother's milk. Why hast thou cursed my brother?'

16. The ascetic claspeth his hand and giveth information about himself. 'Rájá Raghubansí liveth in Banká. I am grandson of

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* Two small coins.

* खिचड़ी *lit.* a mixture of *dál* and rice, hence of any yellow and white things.

† खाइछ 2nd pret.

Tirlokí Singh. I am the son of Bhawandá Singh. O blind sister, I am thine own[*] brother. In thy good fortune thou hast become blind. Thou didst not recognize thine[†] own brother.'

16. When Gopí Chand heard this, he said, 'thou hast obtained wealth, and forgotten me. Dost thou not know thine own brother, born from the same womb as thou. I am thine own brother of thy father's house.'

17. When she heareth this, his sister saith, 'Hear, O Damsel, my words. This man is not worthy to be my brother. Twelve hundred princes are servants in my father's palace. This ascetic is one of them. He knoweth the names of my brother and my father. If my brother Gopí Chand had come, four hundred Táji and Turkí horses would have come out with him. The dust would have flown (to the skies) on account of his elephants. Who would (be able to) count the number of his foot-soldiers? Desolate cities would be re-populated by them, if my brother Gopí Chand had come. There is the mark of a pen[‡] on my brother's hand.' (She saith to the ascetic), 'How much *Tilak*[§] did my brother give (my husband)? How much dowry did he give?' 'O sister, I gave a hundred hundred thousand *Ashrafís* as a *Tilak* and the elephant Bhãwará at the *Duár Pújá;* I gave carts and waggons laden with gold. Who can count the brass vessels[‖] I gave. I did not sum up the account of the cash I expended. My wife's bracelet shineth on thy wrist. My father's ring gleameth on thy finger. Thou art wearing a checked cloth of thy father's house.[¶]

17. 'I will know thee as my brother, if thou wilt tell me what presents I got at my marriage.' Saith Gopí Chand, 'behold, thy father's ring is shining (on your finger), and thy mother's painted scarf, and thy sister-in-law's bracelet.'

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[*] सग = सहोदर.

[†] उदरी = सहोदर.

[‡] *I. e.* He is a scholar, and knows how to write.

[§] Regarding *Tilak* and *Duár Pújá*, see Bijai Mal, *vs.* 104, & ff.

[‖] कँसहँड़ = काँसा + हाँड़ा.

[¶] बाड़िस, ✓ बाड. चित रङ्ग, = चित्र रङ्ग. Compare चित सरिया in the song of Bijai Mal, *vs.* 576. In the Magahí version of this poem (paras. 15 and 18) the word is चिट सारी a checked robe. In Bijai Mal, however, the phrase is said to mean a painted room.

18. When his sister heard these words she ran as a calf that hath broken loose runneth towards its mother. The brother and sister embraced, and all the leaves of the forest fell down (out of emotion). 'I would make and give my brother food, then would I ask him news of my father's house. Hath a Nawáb General invaded and snatched away thy kingdom? I will equip an army and send it against him, and rescue thy kingdom from him.' 'No, sister. No Nawáb General hath invaded and taken my kingdom. It was written in my fate that I should be an ascetic. I will not eat food, O sister, at thy hand. Now my hand is empty.* Sister Birná, look at the food (which was given me) last night. What didst thou give me. My luck was burnt, and thou didst show unto mine eyes† burnt food. The burden‡ hath been removed from thy city.' The ascetic untied and showed the burnt food to his sister, and then her heart burst and she died.

18. When his sister Birná heard this, she caught him by his garment, crying, 'my mother is deserted,* and my brother hath to-day become an ascetic. Sit down, sit down, O brother, on the silk-covered throne, and let me send for all the wealth of the world and give it to thee.' 'At thy door, O sister, what can I do? If I had two or three pice I would have bought bangles and given them to thee.†' Then said her husband's mother and sister. 'Last night didst thou eat of food which had been touched by the hand of Mũ'gá. And now that thou hast been recognized, thou dost obstinately persist (in refusing to accept our hospitality)'. When his sister Birná heard what things and of what kind he had eaten, and when she saw, in the knot of his sheet, the burnt food, she cried, 'woe is me', and died.

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* He reproaches her with her scurvy treatment of him, when she thought he was a Jogí. छूँछ means 'empty.' In regard to food, and especially rice, it idiomatically means 'plain,' *e. g.* छूँछे भात खाईं, 'Am I to eat rice and nothing else?'

† खोरिया = अँखोरी.

‡ *I. e.*, a beggar is like a burden to the city, and this is the way you have tried to get rid of him.

* बिरोगिनि is a corruption of बियोगिनि.

† A brother is by custom always bound to give his sister a present when leaving her house after a visit.

19. King Gopí Chand considereth in his heart, the words of my mother have come true. He draweth from his waistband knives and daggers, and putteth them to his throat. But God above seized and stopped him, saying, 'Why, O my ascetic, dost thou kill thyself. There is ambrosia in thy finger.' So he split his finger and gave his sister (ambrosia) to drink (and she came to life again). Then the ascetic went off on his wanderings.

19. (Saith Gopí Chand to himself), 'Let me strike myself with knife and dagger, and let the brother die in the place of his sister.' Then up came Nárâyaṇa in the form of a Bráhman, and caught hold of him, crying, 'Ho, sinful one, in thy little finger is ambrosia. Give it to thy sister to drink; and thy dead sister will come to life; and do thou take the form of a bee, and go away and be an ascetic.' *(Here the sister is supposed to come to life, and Gopí Chand to go away.)*

20. His sister arose and sat up. Through every lane she wept. She caught the sandal tree and wept; and the sandal tree replied, 'Why dost thou weep? Thy brother hath become an ascetic.' Then cried the sister, 'woe is me', and the earth opened and she entered into it (and was swallowed up by it). And thus was broken the relationship of brother and sister between these two.

* * *

On some more Copper Coins of Akbar.—*By* CHAS. J. RODGERS, *Principal, Normal College, Amritsar.*

(With a Plate.)

When in 1881 I wrote a paper on the Copper Coins of Akbar, it was with much diffidence that I put forward any views of my own. Those views were in fact only deductions from the coins I had before me. Mr. Thomas in a short but friendly paper opposed my deductions. He corrected the reading of one coin from *dám* to *damrá*. I need not say that I knew the inscription would bear this interpretation. I had, however, never seen this word in any books on Indian coins, not even in Mr. Thomas's most exhaustive treatises. I quite agree with him that a *damrá* may be two *damrís*. I was attacked somewhat personally by an anonymous writer in the *Pioneer* who evidently had not been guilty of such patient research as myself. He said Akbar never struck coins bearing the word *tánke*. A look at my plates must have upset his unfounded assertion.

I have, however, to plead guilty of making another mistake. I read a word on several coins as *sikka*. This word, General Cunningham has kindly pointed out to me, should be *tankah.* I quite agree with this correction and am very thankful to the General for the kind manner in which he brought it to my notice. One other reading was also corrected. Here my coin was in fault. I read it *Zarb-i-Illahábás.* On the plainest coins it is certainly *Muhr-i-Illahábás.* It is seldom perhaps so many mistakes are made in one paper. I can only plead the fact that I was busy in making preparations for my furlough and that I had not time to consult my more learned and experienced fellow-numismatists. None, however, of my critics give me credit for introducing to notice so many novelties. A careless perusal of my short paper will show that I proved the *fúlús* to be a coin of uncertain weight, that I gave a *yak tánke*, a *do tánke*, a *damrá*, a *damrí* and several *tankahs* besides the coins of several mints up to that time unpublished and of several up to that time unknown. This I mention to show that my paper was not without some value in spite of its faults. Since 1881, I have kept up my researches and am able now to give a new series of coins which I shall leave to speak for themselves.

The coins I have drawn are all of pure copper. Some are very thick as will be seen from the plate where the two lines under the coins indicate their thickness. The weight of each is given under it in grains.

They are as follows (see Plate I) :—

(1.)	*Obv.*	ضرب بيرات تنكه اكبرشاهي	*Rev.*	اردي بهشت ۴٥ الهي
(2.)	*Obv.*	Ditto	*Rev.*	اسفندارمز ۴٤ الهي
(3.)	*Obv.*	ضرب بيراته نيم تنكه اكبرشاهي	*Rev.*	خورداد ۴٤ الهي
(4.)	*Obv.*	Ditto	*Rev.*	ماه تير ۴٤ الهي
(5.)	*Obv.*	چهارم حصه تنكه اكبرشاهي	*Rev.*	ضرب آگره اسفندارمز ۴٥ الهي
(6.)	*Obv.*	هشتم حصه تنكه اكبرشاهي	*Rev*	ماه ابان ۴٦ الهي
(7.)	*Obv.*	دهم حصه تنكه اكبرشاهي		
		ضرب دهلي شانز	*Rev.*	ماه فروردين ۴٢ الهي
(8.)	*Obv.*	ditto (without mint)	*Rev.*	ماه تير ۴٤ الهي
(9.)	*Obv.*	same as (7)	*Rev.*	ماه مهر ۴٦ الهي
(10.)	*Obv.*	نصفي	*Rev.*	geometrical figures.
(11.)	*Obv.*	نصفي	*Rev.*	ditto.
(12.)	*Obv.*	ضرب — تنكه اكبرشاهي	*Rev.*	خورداد ۴٤ الهي
(13.)	*Obv.*	مهر الها باس	*Rev.*	سنه ۳۱ الهي
(14.)	*Obv.*	يك تنكي اكبرشاهي	*Rev.*	ضرب كابل اسفندارمز ۴٦ الهي

Of these coins Nos. 1, 2, 12 are the property of my venerable and kind friend General Cunningham, No. 11 is from an impression by the same gentleman at Lucknow in 1840, and given to me some years back.

No. 3 is the property of Dav. Ross, Esq., C. I. E., M. R. A. S., &c. Traffic Manager Sind, Panjab and Delhi Railway. No. 14 belongs to L. White King, Esq., C. S., a most indefatigable numismatist. The remainder are from my own poor cabinet.

By comparing this list of coins with that published in my former paper, it will be seen that of Akbar's Copper Coins we have, now, knowledge of the following:—

		weights in grains.			
The one tánke	يك تانكے		59		
The two tánke	دو تانكے		108,	109.	
The one tanke	يك تنكے		58·8.		
The damrí	دمری		40.		
The damrá	دمرا		76.		
The fulús	فلوس	326,	149,	38,	37.
The mohur	مہر		316.		
The tankah	تنكه اكبرشاهي	618,	620,	623·4,	626.
The half tankah	نيم تنكه			317·5,	309.
The fourth part of the tankah	چهارم حصه تنكه			153·1.	
The eighth part ditto	هشتم حصه تنكه			39·5.	
The sixteenth part ditto	شانزدهم حصه تنكه			37·5,	38·5.
The nisfe	نصفے			154·5.	

I know of only one one-*tánke* piece and of only one one-*tanke* piece both of which are given in my papers, and neither of which belongs to me. I have seen only one *nisfe* and one-fourth part of a *tankah* and one eighth part. Sixteenth parts are common. I have about a dozen of them. The *tankah* is as rare as it is large. The halves are still rarer. The two given in my paper are the only ones I have yet seen. The cabinets of other numismatists and of museums may contain others. Of the *mohur* one specimen is published by the Honorable Synd Ahmad, C. S. I., in his edition of the *Áín-i-Akbarí*. But in a conversation I had the other day with him, he disputed this reading, and was inclined to my former reading *zarb*.

I am not going to bring forward any views of my own on this occasion, or make any deductions from the coins. I will simply quote a letter sent me by General Cunningham, after we had discovered the *tankah* and its parts, and thus fixed the weight of this coin.

Simla, *5th July*, 1883.

My dear Rodgers,

Ever since we got the Tanka of Akbar *fixed* I have been thinking of Akbar's revenues, and at last I *think* that I see some light.

Thomas began his reasoning with an assumption that "there can be very little contest about the value of Nizám-ud-Dín's pieces designated as Tankah-i-Murádí." He takes them to be the same as the old Sikandarí tanka of twenty to the rupee (p. 7, Akbar's Revenues) which is certainly wrong. He *assumes* that they were so; but gives no proofs, nor even any arguments.

Now let us examine the facts :—

De Laët gives Akbar's revenue on Jahángir's accession in two forms : thus :—

VI. Arab et 98 caror Dám.
or III. Arab et 49 caror *Tangarum.*

Now here is a new proof of 1 Tanga = 2 Dáms.

	Arabs	kross	tákhs.			
Abul Fazl's collected amounts come to	5,	67,	63	83,	383	dáms.
Nizám-ud-Dín's statement	6,	40,	00	00,	000	murádí tankas.
De Laët's statement	6.	98.	00	00.	000	dáms.

Put in this way it seems clear to me that Nizám-ud-Dín's *murádí tankas*, are the common dáms of Akbar. I do not understand the name of *Murádí*, but I think it possible that there may be a mistake in this name ; and for the following reason :—

I have two copper coins of Akbar, like your No. 15,—but both of them used مہر *muhr* instead of *zarb.* *Muhr-i-Ilahábás*, the stamp or coin of *Ilahábás.* (See No. 13 of my present plate, which I have drawn from a perfect coin of my own, two, illustrate this portion of General Cunningham's letter.) The name of the coins would then become مہراوی Muhráwí, and hence I take them to be the real pieces intended by the corrupt name of *Murádí.* Can you refer to any MS. of the Tabaqát-i-Akbarí?

Had Nizám-ud-dín intended the *tankas* of Akbar, there was no necessity for calling them by any other name than simply *tankas*, as written on the coins themselves. But as *dám* was a new name, introduced by Akbar himself, it seems highly probable that the coins of the same weight as Akbar's *dáms* were previously known as *tankas* with some qualifying title. (In fact Sher Sháh's 320 grain coins *were called tánkas.*)

(By the way my two heavy (640 grain) tankahs of Akbar are not from your Dehli mint but from Bairát, as I read the name—I will of course send them to you.)

Now as to Akbar's revenue. Turn to Thomas, p. 52 and add up Sháh Jahán's revenues from the same provinces as Akbar held. The total is 18 krors + 50 lacs of rupees. Now compare the progressive revenues in krors and lakhs of rupees.

		Krors	lakhs.	
Akbar	Abul Fazl	14,	97	
	Nizám-ud-Dín	16,	00	
	De Laët	17,	45	
	Sháh Jahán	18,	50	
	Same provinces			
	Sháh Jahán later	22,	00	
	Aurangzeb	26,	74	
	Ditto	35,	64	
	Ditto	38,	62	
	Ditto	30,	17	after loss of provinces.

Now these figures of progressive revenue show incontestably that Akbar's revenue could not have been more than 16 krors,—and the double statement of De Laet, in *tankas* and *dáms*, is specially clear and serves to fix the value of Nizám-ud-Dín's *Murádí tankas* as simple *Akbarí dáms*.

I am,
very sincerely yours,
A. Cunningham.

I, on my own part, would only draw attention to the fact that these *tankahs* of Akbar, and the different parts of the same coin, seem to have been all struck in the last ten years of his reign, between 40 and 50 Iláhí. The weight of the نصفے seems to make it as a *half dám*. At the same time I must say I have never yet seen a coin with the name *dám* on it. The Honorable Syud Ahmad told me he had seen one.

From the weights given above, it would seem that the *tankah* weighed about 640 grs. The half 320, the quarter 160, the eighth part 80, the sixteenth part 40. Against this, however, we have the weights of two coins published in my former paper Nos. 18 and 19 of Gobindpúr and Dogám which are called *tankahs* and weigh 327 and 319 grains. The Bairát* *tankahs* and *half tankahs*, the Ágra *quarter* and the Delhí

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* For interesting facts regarding *Bairát*, see the Reports of the Archæological Survey of India, Vol. II, pp. 342-6, and Vol. VI, pp. 91-103. It was famous for its copper mines. I am ignorant of the position of *Dogám*. There are several *Gobindpurs*. We want sadly a *Historical Geography of the Muhammadan period*. Conquerors changed the names of places. The names remained for a time and were allowed then to fall into disuse. Thus *Adúní* was called by Aurangzeb *Imtiyázgurh*. Rupees were struck bearing this latter name. I have seen several though I possess none. I should like to know where *Álamgípúr* is, and a lot of other places.

sixteenth parts, however, show that in other parts of the empire there was one acknowledged standard weight for the *tankah.*

I do not intend this paper as an answer to the kind papers of Mr. Thomas and Mr. Keene. It is rather an apology for my former paper and its mistakes, and is intended as an additional contribution to our knowledge of Akbar's copper coinage. I do not know the date of the completion of the *Áín-i-Akbarí,* but in it a very incomplete account is given of Akbar's copper coinage. Our cabinets, however, provide us with coins of the whole reign from the 963 year coins of Nárnol to the 50th Iláhí year coins of Ágra. It remains for historians and revenue officers to discuss the matter in the light these new coins give.

I may add that the Áín Akbarí gives many subdivisions of the rupee of Akbar, and that as my cabinet contains specimens of each piece, I shall, if I can find time, give a plate of those subdivisions.

P. S. Since the above was in press I have visited Ágra, Muttra and Delhí and have obtained two Ágra *tankahs;* several *ním tankahs,* one of Ágra; two *chhárum hissa i tankahs,* and one Kábul *do tanke* piece. All these tend to confirm what I have advanced in this paper.

* * *

Some Coins of Ranjít Deo, king of Jummú a hundred years ago.—*By* CHAS. J. RODGERS, *Principal, Normal College, Amritsar.*

(With a Plate.)

In the first year of the present century Ranjít Singh "the Lion of the Panjáb" conquered Lahore. For many years after that event, he was so constantly engaged in subduing the whole of the cities and states of the Panjáb that his name and fame seem to have hidden altogether the name of a better man who bore the name of Ranjít Deo and who ruled in the hill state of Jummú or Jummún as we shall see from coins.

Writing of Jummú, Mr. Frederick Drew in "The Northern Barrier of India"* says: "A century ago the old regime was flourishing under Rája Ranjít Deo; he is still spoken of with the highest respect as a wise administrator, a just judge, and a tolerant man. At that time the direct rule of the Jummú Rája hardly extended so much as twenty miles from the city; but he was lord of a number of feudatory chiefs, of such places as Akhnúr, Dalpatpúr, Kiramchí and Jasrotá, all in the outer Hill tract, chiefs who governed their own subjects, but paid tribute to and did military service for, their liege lord of Jummú.

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* Chapter III, pp. 40, 41.

"During a portion of the year they would be present at that city, attending the court of the ruler and holding separate ones themselves. At this day various spots in the town are remembered where each of these tributaries held its court on a minor scale. Doubtless there was some petty warfare, resulting sometimes in an extension and sometimes in a contraction of the power of the central ruler; but usually the chiefs were more occupied in sport than in serious fighting, and, in fact, the various families had continued in nearly the same relative positions for great lengths of time."

"From the time of Ranjít Deo's death the fortunes of Jummú became more dependent than before on the world outside the rugged hills, the result being a change in, and at length almost a complete break-up of, the old system of government."

Mr. Drew does not tell us when Ranjít Deo ascended the throne or when he died. He adds in a foot note "Ranjít Singh was of the Jaṭ caste, and was in no way connected with Ranjít Deo or with any of the Dogra tribe." We learn, however, from the "History of the Panjab,"* Vol. I, p. 219, that in 1762 A. D. Ahmad Sháh Durrání after almost annihilating the Sikhs in an engagement near Ludhiana, a disaster "characterized in Sikh tradition as the *ghulu ghara* or bloody carnage," "his attention was turned towards Kashmír where his governor Súkh Jewan had for nine years conducted the administration without remitting any portion of the revenues to the royal treasury. The co-operation of Ranjít Deo, Rájá of Jummú, having been secured, with some difficulty, a strong detachment was sent from Lahore, under the command of Núr-ud-Dín, and the Rája conducted it across the Pír Panjál mountains into the valley, which submitted after a slight resistance. Súkh Jewan being made a prisoner was punished with the loss of his eyes. Ahmad Sháh, having made these arrangements to secure his territory east of the Indus, returned to Kábul at the end of the year 1762 A. D."

The same writer tells us on p. 237,—"The Hill Rája of Jummú Ranjít Deo, had a misunderstanding with his eldest son, Brij Ráj, and desired to set aside his pretensions to the succession in favour of the youngest, Mián Dulel Singh. In order to secure his hereditary rights, Brij Ráj broke into rebellion, and applied to Charat Singh,† offering a large yearly tribute, on condition of his aiding to depose his father. Charat Singh having an old enmity against Ranjít Deo, closed with the offer, and strengthening himself by association with Jai Singh of the Ghanía Misl, their united forces marched into the hills, and encamped at

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* London, Wm. H. Allen and Co., 1846.

† The father of Máhá Singh and grandfather of Ranjít Singh.

Udhachar, on the banks of the Basantar river. The Rája having timely notice of the designs of the heir-apparent, had made corresponding preparations for resistance. The defence of the capital he reserved to himself, but collected a force to oppose the invasion, composed of auxiliaries from Chamba, Núrpúr, Basehar, and Kángṛa, in the hills, to which were added, besides a party of his own troops, the confederated forces of the Bhangí Misl, under Jhandá Singh, whom he induced to lend his services in the extremity. The two armies lay encamped on opposite sides of the Basantar, and in a partial skirmish between the Sikh auxiliaries Charat Singh was killed by the bursting of his own matchlock.

He was 45 years of age, and had risen from a common Dharwí or highway man, to be Sardár of a separate Misl, with a territory computed to yield about three lakhs of rupees. He left a widow, Desan by name, with two sons and a daughter, called respectively Máhá Singh, Subuj Singh and Ráj Kanwar. The eldest son, Máhá Singh, then ten years of age, succeeded to the Sardárí; but the widow and Jai Singh Ghanía assumed the immediate direction of affairs. It was determined by them to assassinate Jhandá Singh Bhangía, who was the mainstay of the Jummú Rája's party, and the avowed enemy of both the Sukar Chakía and Ghanía Misls. A sweeper was tempted by a large bribe to undertake this hazardous enterprise, and he succeeded in effecting his purpose by firing at, and mortally wounding the Bhangí chief, as he was walking unattended through the Jummú camp. The Sukar Chakía and Ghanía Sikhs being satisfied with the revenge thus taken, withdrew soon after from the enterprise in which they had been engaged. The Bhangí troops had simultaneously left the opposite camp on the death of their chief. Thus Brij Ráj Deo was left alone to settle with his father, his rights of inheritance to the Ráj: before the departure of Máhá Singh, however, he went through the ceremony of an exchange of turbans with Brij Ráj, which bound him to brotherhood for life. These events occurred in 1774 A. D."

Rái Kanhiyá Lál, Bahádur, in his Urdú History of the Panjáb, Lahore, 1877, gives some further particulars (p. 119) of this matter. He says that in those days the city of Jummú was regarded as the abode of peace and safety, that bankers and merchants had fled from the Sikh-spoiled plains of the Panjáb and had taken refuge in Jummú where Ranjít Deo was too strong for the Sikhs to attempt anything against him. He gives the name of the battle as Dású-suhára in the government of Zafarwál. The sweeper, he says, was a Muzhabí khidmatgár. (The Mazhabís* are sweepers, but they have always been an honoured and trusted people since 1675 A. D., in which year some sweepers rescued the mutilated body of the Gúru Tegh Bahádur from the streets of Dehlí where it had been exposed by Aurangzeb. We have several regiments of Mazhabí Sikhs in our Indian army at the present day, and their deeds in arms show that "trust breeds trust.") He adds that Ranjít Deo gave Jai Singh 150,000 rupees for the assistance he had rendered. But here as in other places he gives us no clue as to when the event happened. There is a dispute as to whether this affair took place in 1771 or 1774. The latter date seems to be supported by the best authorities. The histories of Kashmír that I have consulted say nothing at all about Ranjít Deo.

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* The word *mazhabí* means religious.

Jummú figures little in history after this. In 1812 A. D., Ranjít Singh, although busy with his plans for obtaining the Koh-i-Núr diamond from the blind refugee Sháh Zamán, found time for making arrangements for the conquest of the hill states south of the Kashmír valley. Jummú was captured by his newly married son Kharrak Singh, says Cunningham in his History of the Sikhs. Kanhiyá Lál says* that Díwán Bhawání Dás took Jummú from the Pahárí Dográ Ḍeḍo in an expedition which lasted only one month. He also tells us† that Kasúr Singh the father of the three brothers who made such a figure in the court of Ranjít Singh,—Dhyán Singh, Guláb Singh and Suchet Singh—was a descendant of the Rájas of Jummú. In Macgregor's History of the Sikhs, Vol. I, p. 168,‡ we read "During this year (1812), Bhái Rám Singh, who was the Peshkár of Kharrak Singh, received Jummú in jagír." From these three somewhat different accounts we may learn that Jummú was conquered by the Lion of the Panjáb in 1812.

In the Urdú Táríkh-i-Makhazan-i-Panjáb by Gulám Sarwar published by Nawwal Kishore we have without dates a genealogical table which is interesting although I cannot vouch for its correctness, and which is given at the end of this paper.

The author tells us that in the time of Brij Ráj Deo matters were in the greatest confusion in Jummú. He does not tell us whether he had any family or not. The Dográ Rája Ḍeḍo mentioned by Kanhiyá Lál may be his son. I regret that I can give no dates and so little information about Ranjít Deo. I think, however, that I have shown who he was and the position that he held in the Panjáb at a time when its history is little known. The time in which he lived was one of utter lawlessness, yet his little state was the abode of peace and safety (دارالامان). The Afghán Ahmad Sháh had overrun the Panjáb.

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* Urdú History of the Panjáb, p. 209.

† *Ibid.*, p. 259.

‡ London, James Madden 1846.

The Sikh Misls, twelve in number, were then rising into power, and as each one rose, it strove to overpower all the others. In Dehlí, a blind king was on the throne, and his servants misruled the country on their own account, and murdered each other according to their own sweet wills. Nevertheless during all this misrule, the coins of the empire were struck in the name of that blind king Sháh A'lam II. I have rupees of every year of his struck in Dehlí and other places, and he reigned 49 years. Some time ago I obtained a rupee of his 24th year. The inscriptions on it are (see plate I, fig. 1.)

Obv. سکه شاه عالم بادشاه غازي ۱۱۹۶
Rev. ضرب دارالامان جمون سنه جلوس میمنت مانوس ۲۴

This coin I attribute to Ranjít Deo. It was struck as we see at Jummoo in the name of Sháh A'lam. The year is that of the Hejirah, and the year of the reign corresponds. Sháh A'lam's rupee of the 1st year is dated 1174. But he may be said to have commenced his reign in 1172. The Dehlí rupee I have of his 23rd year is dated 1195 A. H. This Jummoo rupee of the 24th year is dated 1196 A. H. The 26th year is 1197, the 27th 1199, and the 28th 1200. So that this Jummoo rupee takes its place in quite a correct manner in the list.

It will be noticed how the title of the city "*Dár-ul-Amán*" the "*Gate of safety*" agrees with the description of its condition under Ranjít Deo as given above by Raí Kanhíyá Lál.

Whether Ranjít Deo acknowledged the sovereignty of Dehlí or not, I cannot say. His rupee has on it the name of the nominal suzerain of India, a name found on all the coins of the East India Company and on coins struck at Muhammadábád (Benares), Indarpúr, Mustaqir-ul-Khiláfat A'gra, Ahmadnagar Farrukhábád, Murádábád, Dehlí, Muhammadnagar, Dár-ul-Barakát, Dár us Sarúr Saháranpúr, Najíbábád, Barellí, Lutfábád Barellí, Tírath Hurdwár, Muzaffargarh, Arcot, Maheswar (= Maisore).[*] I have not yet found a coin of Sháh A'lam II struck in Lahore or in any mint of the Panjáb proper. As I showed in my paper on "The Coins of the Sikhs," the Sikh Commonwealth commenced striking rupees in A. D. 1765, a practice which they continued with few interruptions under their many rulers up to A. D. 1849, in Lahore, Amritsar, Multán, Pesháwar, Kashmír, &c.

However shortly after this in the 27th year of Sháh A'lam II, we find Ranjít Deo striking coins at Jummú in his own name, on which he uses the Sambat year, but strange to say, still retains the year of the reign of Sháh A'lam, and on which he places the symbol of imperial power—the umbrella—so frequently occurring on the coins of that suzerain.

See Plate I, fig. 2.

Obv. I can't decipher this
رنجیت دیو آباد کرد (ن not present).
سمبت ۱۸۴۱

Rev.
ضرب دارالامان جمون سنه ۷ ۰۴
جلوس میمنت مانوس

fig. 3.

Obv. Same as fig. 2, but with addition of حار below رنجیت which word is in full.

Rev. Same as No. 2, but year ۲۸

fig. 4. *Obv.* and *Rev.* same as fig. 3 with variations.

1196 A. H. corresponds with 1781 A. D., and is on the coin the 24th year of Sháh A'lam. The Samvat year 1841 corresponds with 1784 A. D., and is on the coins the 27th and 28th years of Sháh A'lam. These coins therefore were struck about 10 years after the disagreement Ranjít Deo had with his son. They are the only coins of Ranjít Deo I have yet met with during many years of continuous search. They show us what valuable aid coins may give us in unravelling and illustrating history.

Of the title of the city of Jammú found on the coins, دارالامان Dár ul-Amán, we may incidentally remark that the same title is found on some of Humáyun's anonymous coins struck at *A'gra.* It was also the title given to *Multán* more because of the rhyme than the reason. We find it on the rupees of Aurangzeb and his successors, and also on the coins of the Sikhs struck at Multán. The strong fort of this place may, however, often have afforded shelter to the people of the western Panjáb where it was the only stronghold of any size or importance.

The numbers under the coins indicate their weight in grains. Five rupees struck at five different Indian mints of Sháh A'lam average I find 171·3 grs. So that the Jummú rupees had nothing to do with the old silver coinage of Kashmír but were coins of the Empire, over which Sháh A'lam exercised nominal sovereignty.

Since writing the above I have had lent me "A History of the Reigning Family of Lahore with some account of the Jummoo Rajáhs" by Major G. Carmichael Smyth, Calcutta, W. Thacker and Co., 1847, a book published by subscription and now very rare. The author supplies what no one of the authorities I quote from gave me the *dates.* Ranjít Deo was born in 1724 A. D. He ascended the throne in 1742 and reigned "in peace and prosperity till 1780 A. D. when he died."

The only matter not noticed by the authorities I have used, but described by Major Smyth is that Ranjít Deo was imprisoned by the governor of Lahore from 1749 to 1760 A. D., when he escaped on a horse no one could tame except himself. After visiting his mountain home, however, he returned to Lahore and to captivity, but the governor was so much struck with this noble conduct he allowed him to return to Jummú.

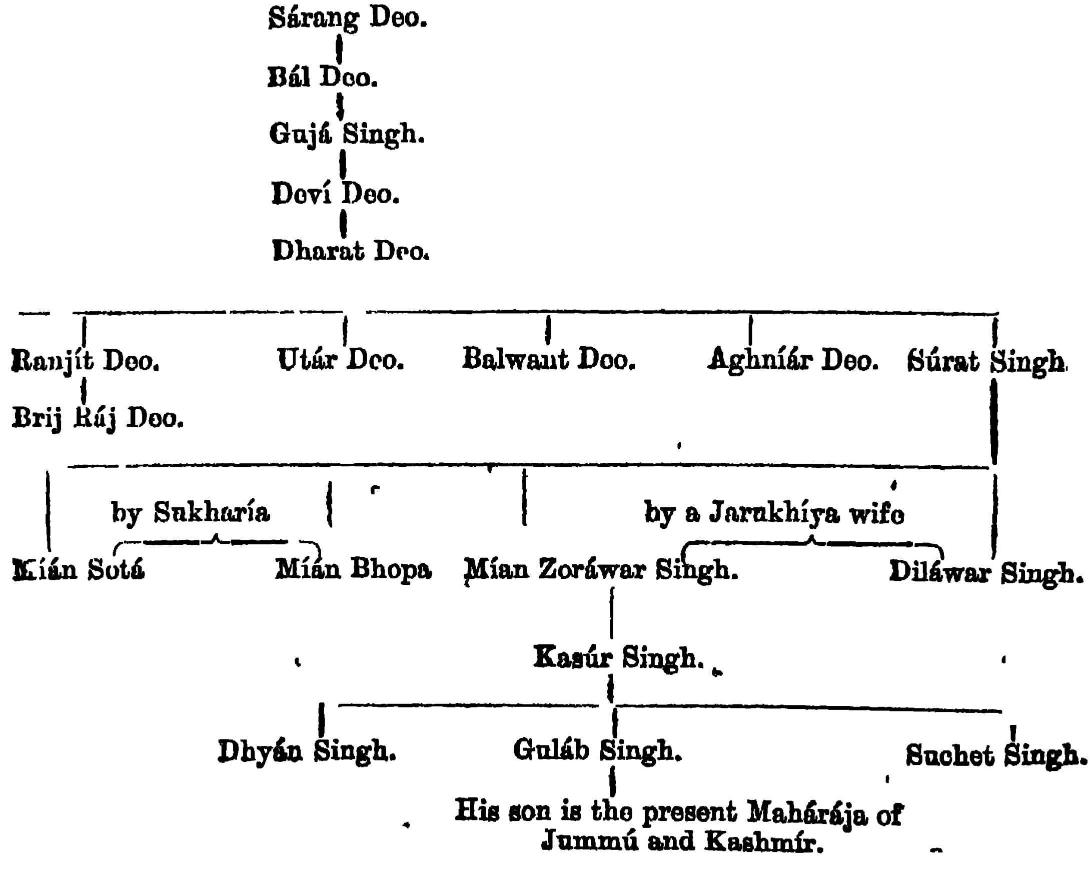
P. S.—I have just obtained some more specimens of the coins of Ranjít Deo. From a comparison of five I am able to complete the deciphering of the inscription on the obverse. It is as follows :—

خانة رنجيت ديو آباد کرد
لچمي نراين دل شاد کرد

which may be literally translated thus :—

Ranjít Deo peopled this part, Lachmí Naráin made glad its heart.

GENEALOGICAL TABLE (see p. 63).



The Coins of Ahmad Sháh Abdállí or Ahmad Sháh Durrání.—*By* Chas. J. Rodgers, *Principal, Normal College, Amritsar.*

(With Plate II.)

The Panjáb, the Border land of India has been invaded oftener than any other country in the whole world. The more than dozen incursions of Mahmúd of Gazní, the five or six of Muhammad Gorí, the terrible visitation of Taimúr, the plundering expedition of the execrable Nádir, and the frequent invasion of Ahmad Sháh the conquerors of the Mahrattas at Pánípat were all borne by the Panjáb. Scarcely any other part of India suffered from them, or if they did, the Panjáb suffered both before and after. No good accrued to any province of India from any one of these inflictions. The work done by each of these scourges was one of destruction and not of construction. No public works attest the presence of these mighty ones in India. And yet each one has left behind him some sign of his hated though short rule. Mr. Thomas has edited the coins struck in India by Mahmúd and his successors, and those of Muhammad Gorí. I myself edited in a late paper the only known Indian coin of Tímúr, a miserable copper damrí. In my late furlough I edited the coins which Nádir Sháh struck during his short and disastrous visit to Dehlí. I propose in the present paper to give a short account of the coins which the successor of Nádir Sháh,—Ahmad Sháh Abdállí struck in India. If we bear in mind that the striking of coins in India is a prerogative of royalty, and one which has always been exercised the moment a man sat on the throne; moreover if we remember that the mint was carried with the royal camp,* we shall at once see that if we collect specimens of each year and of each mintage, we shall have a chronological account if the events of the reign in coins: we shall also see the expansion of each king's rule or otherwise.

Ahmad Sháh invaded India several times. On each occasion he struck coins. If in a place only a few days, the numismatic records are not silent about the visit. The king may have been dominant before his coming and after he had gone. But during the time the invader stayed, he coined. Hence we often have coins struck in one year at the same place by the conquering and the conquered ruler. This it is which lends interest to the coins of Ahmad Sháh Durrání. They are not old. But they are becoming rarer every day. Indeed it is seldom they are now met with. As they are the only relics of the man who saved us the trouble of destroying the Mahrattas, and as they illustrate his movements in India so exactly, I have deemed it worthy of me as a numismatist to rescue the coins from oblivion and the inevitable melting-pot.

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* I have lately become possessed of a dirham of Báber's struck in the camp (Urdú اردو). *Urdú Zafar Qarín* is a common mint of Akbar's.

Ahmad Sháh was no relative of Nádir Sháh. He was by birth of the Abdállí tribe and was probably born at Multán. The Abdállí tribe trace their origin to a descendant of Abraham named Qís who flourished in the time of Muhammad, and who embraced the doctrines of Islám. I do not think this the place to go further into this matter. Suffice it to say, that Ahmad Sháh was the most trusted of all the members of the court of Nádir. Nádir was not happy with respect to his own children. During his lifetime he is said to have told Ahmad Khán that after his death, he would be king.

Nádir Sháh was slain by his officers on the 11th of Jamádí-ul-Ákhir 1160 A. H. The next day Ahmad Khán defeated the conspirators, and possessing himself of all the treasure of his murdered master, fled to Kandahár. There is a story told by the historian of Ahmad Sháh that, when Ahmad had performed two days' journey towards Kandahár, a faqír named Sábir Sháh with whom he had been previously intimate, approached him and said "Now Ahmad Sháh you are indeed king." When the king said that he had not yet been crowned, the faqír making a platform of earth led the king to it, and taking some grass put it on his head, saying, "This platform is your throne and this grass your crown. I proclaim you king by the name of Ahmad Sháh Durrání." This name the king adopted instead of his former tribal name Abdállí. Durr is a pearl. Ahmad on some of his coins styles himself Durr-i-Durrán the pearl of pearls. This Sábir Sháh at first stayed with Ahmad, but being sent on a message to Lahore, he was there murdered.

Arriving in Kandahár Ahmad Sháh was formally crowned. He ordered coins to be struck bearing the following couplet:—

حکم شد از قادر بیچون باحمد شاه ·
سکه‌زن بر سیم و زر از اوج ماهي تا بماه

Immediately afterwards we find him on his way through Gazní to Kábul which he reduced, and afterwards he obtained possession of Peshávar, whence he returned to Kandahár. Settling his affairs there and hastily collecting an army of about 12,000 horse with which he entered the Panjáb, he was before Lahore, ere the letter containing an account of his invasion had reached Dehlí. The Governor of Lahore fled, and all the arsenal fell into the conqueror's hands. He did not let the grass grow under his feet. Meanwhile the worn-out Mogul Muhammad Sháh sent his son and prime minister Qamar-ud-Dín to dispute his progress. The armies met at Málúpúr, six kos from Sarhind. There were skirmishes for several days, during one of which the prime minister Qamar-ud-Dín was killed. In a general engagement which ensued, the Afgháns bethought them of some rockets they had found at Lahore. They essayed to use them against the enemy, but unfortunately they did not know how to discharge them. Instead therefore of injuring their foes, they hurt themselves, for they put the rockets in the wrong way. The Durrání army being thus self-defeated fled. This series of engagements and the flight of the army took place in Rabía ul Awwal 1161 A. H., or within 10 months of the murder of Nádir, *i. e.*, in the first year of Ahmad Sháh Durrání.

My first rupee (Plate II, fig. 1) illustrates this campaign. It was struck at Lahore in his first year سنه احد. The inscriptions on it are as follows:—

در دران احمد شاه بادشاه احد
ضرب دارالسلطنه لاهور
میمنت مانوس

The reverse has on it the couplet given above and 11, portions of the date 1161. The meaning of this couplet may be thus rendered:—

Ahmad Sháh, received an order from the Unlike Powerful One
To strike coins in silver and gold from the height of the fish to the
Moon.

As Ahmad Sháh the son of Muhammad Sháh was returning from the battle in which the Durrání Ahmad was defeated, he heard of the death of his father which took place on the 26th of Rabía us Sání 1161.

I have a coin of the 2nd year of Ahmad Sháh Durrání. On the reverse it has:—

جلوس میمنت مانوس سنه ۲
ضرب پیشاور

I have seen no early Afghán coins struck at Kábul or Kandahár; so I judge they must be very rare. The Dehlí Ahmad must have recovered Sarhind and Lahore the same year, for I have rupees struck at these two towns in his first year 1161 A. H. Sarhind in those days must have been a glorious city, if the space now covered with ruins was inhabited.

Meer Munnoo the son of Qamar-ud-Dín was made governor of Lahore. He destroyed the fort Rám Rownee which the Sikhs had made at Amritsar. The Durrání hearing of the death of Qamar-ud-Dín in battle and of the Dehlí emperor's after it again crossed the Indus. He was, however, persuaded to retire. To this second invasion I attribute the Pesháwar coin of his second year given above.

Meer Munnoo grew strong in Lahore. He became almost independent of Dehlí, and the tribute he had promised to the Durrání king in order to persuade him to retire, he never paid. This brought Ahmad Sháh again to the Panjáb. Meer Munnoo waited for him under the walls of Lahore where a battle was fought, the result of which was, that he was taken prisoner. When brought before the conqueror, he was asked, "Had you taken me prisoner, what should you have done?" "Cut off your head and sent it to my master the Emperor of Dehlí," was his answer. "Now I have you in my power, what shall I do with you?" was the next question. He replied "If you are a tyrant destroy me, if you are merciful forgive me." This so pleased the Durrání that he was reinstated as governor of Lahore. All the treasure of Lahore fell into Ahmad Sháh's hands. Lahore and Multán fell under the sway of the Afgháns. Those matters occupied the 3rd, 4th and 5th years of the king's reign. The second coin drawn illustrates this conquest of Lahore. The obverse is occupied by the Persian couplet. The reverse has the following inscription :—

جلوس میمدت مهانوس سده ٥
ضرب دار السلطده لاهور

I have two rupees of Ahmad Sháh of Dehlí struck at Lahore in *his* 4th and 5th years 1164 and 1165 A. H. So his power was not altogether gone.

The 3rd, 4th, 5th and 6th coins illustrate the hold the Durrání king kept on the annexed province of Multán and the trans-Indus provinces Of Nos. 3 and 4 I give only the reverses. They are as follows :—

No. 3. ضرب ملتاں سنه ٦ جلوس میمدت مانوس
No. 4. ضرب دیرة سنه ٧ جلوس میمنت مارس

No. 5 is unique :—

Obverse ٧ در دران احمد شاه
Reverse 1167 ١١ ٦٧ ضرب پیشاور

No. 6 is a beautiful coin belonging to Sir Edward Clive Bayley who kindly gave me permission to copy it :

Obverse in lozenge :— ١١ ٧٠ در دران احمد

Round this is the Persian couplet, and the date ١١٧٠.

Reverse :— ٥ ضرب دارالامان ملتان جلوس ٩ میمنت مانوس

Besides the above I have a rupee of *Multán* of his 5th year and one of the 7th. Also one of *Bhakkhar* of the 7th year, which shows that these parts were under the sway of the Durrání king. There is a rupee of the 10th year struck at *Lahore*, in the British Museum.

These five years, from the 5th to the 10th of the reign of Ahmad Sháh Durrání, were full of events which happened both in Lahore and Dehlí. Meer Munnoo, governor of Lahore, died of cholera. His widow Mugalána Begum took up the reins of government and held them with a strong hand. But her son-in-law, Ghází-ud-Dín, invaded the Panjáb, and with the aid of Adína Beg ruled it, until Ahmad Sháh hearing of the disturbances in the country again visited the scene of his former conquests. In Dehlí Muhammad Sháh, the Mogul Emperor, had been dethroned, imprisoned, blinded and murdered and Álamgír the second had been placed on the throne 1167 A. H. It was in 1170 A. H. that Ahmad the Durrání returned to India, Mugalána Begum met him with an army which she united to his at Lahore. He made his son, Tímúr Sháh, Nizám of Lahore and Multán, while he himself passed on through Sarhind to Dehlí. Coins Nos. 15 and 16 of my plate illustrate this fact. The obverse of these rupees has the following Persian inscription on it:—

بعالم یافت سکه تیمور شاه نظام
بحکم خدا و رسول ایام ۱۱۷۰ 1170

The reverse of No. 15 has:—

جلوس میمنت مانوس سنه احد
ضرب خارالسلطنه لاهور

Another rupee with exactly the same inscriptions has the year ۱۱۷۱ A. H., thus showing that the 1st year of Tímúr Sháh's Nizámat was in 1170-1 A. H.

The reverse of No. 16 has:—

جلوس میمنت مانوس سنه ۲
ضرب دارالامان ملتان

The obverse of this, No. 16, has the same inscription as No. 15 but without any year. (Just as I had finished this sentence a coin dealer brought me over 200 rupees to examine. I found one of Multán of the 1st year of Tímúr Sháh's Nizámat 1170 A. H.)

When Ahmad Sháh arrived at Dehlí he began to plunder. From the son of his old enemy Qamar-ud-Dín he obtained two krore rupees' worth of ashrafís, and a krore rupees' worth of jewels. He employed Mugalána Begum on this work, and as she knew all the people of Dehlí, she caused a lot of wealth to be brought in. Besides this the Durrání married the daughter of Muhammad Sháh, and Tímúr Sháh married the daughter of Álamgír II who seems to have helped in the plundering of his own capital. Ahmad Sháh stayed in all about 40 days in Dehlí, coin No. 7 of my plates illustrates this short period.

Obv.— The Persian couplet and the year ١١٧٠.

Rev.— سنه ١١ جلوس میمنت مانوس
ضرب دارالخلافه شاه جهان آباد

I have seen rupees apparently from the same dies. As Ahmad Sháh was in Dehlí only 40 days, it is not at all wonderful that I have a rupee of Alamgír II struck in his 4th year 1170 A. H., the year of Ahmad Sháh's invasion. During this occupation of Dehlí Mathurá was plundered. Its idols and temples were overthrown and many were massacred. The historian says that not a single straw was left in Dehlí. Álamgír II was restored to the throne, but the creatures of Ahmad were left everywhere. In passing through Amritsar "hundreds of Sikhs were slain and thousands of houses destroyed." Tímúr Sháh was left in Lahore with an efficient general, and Ahmad betook himself and his plunder to Kandahár.

No sooner had the Durrání sovereign left the country, than Adína Beg who had been hiding in the mountains attacked Lahore and took it. But this must have been about 1173 A. H., as the British Museum has rupees of Tímúr as Nizám of Lahore for 1171 and 1173, the year of the Nizámat on this latter one being 3. Adína Beg prospered. But in Dehlí matters went from bad to worse. The Mahrattas, being called in to assist on one side of the quarrel, made themselves masters of the city. They then advanced on Sarhind which they plundered. Lahore next fell before them. After this they attacked the prince Tímúr Sháh who had entrenched himself at Imánábád. He was defeated and he fled to Peshávar pursued by the Mahrattas. The Sikhs chose this opportunity for showing their heads. Their numbers had been increasing in spite of persecution. They rebuilt Amritsar after they had forced Muhammadans to clean it. They held Lahore even for a short time at this period.

I have one rupee of Ahmad Sháh's 11th year, and one also of his 13th year struck at *Lahore.* These must have been struck when his officers were paramount in that city.

Álamgír reigned nominally in Dehlí till his 6th year. I have a rupee of his 6th year struck in Lahore in 1172. One of his 5th year, struck in Kashmír, is dated 1173 A. H. One of his 5th year and one of his 6th, both struck at Ahmadnagar—Farrukhábád, are both dated 1172. Both these were obtained from Quettah. Can it be possible they were part of the plunder taken away by Ahmad Sháh after the campaign I am about to describe?

When Ahmad Sháh saw the Panjáb lost to him, he returned, to the dismay of the Mahrattas who fled as he approached. Owing to his presence Alamgír was murdered. Alí Gaur Sháh Alam was away in Bengal. The Mahrattas retiring, Ahmad Sháh took Dehlí. This took place in 1173 A. H. Dehlí was given over to plunder for 3 days. The whole Dúáb fell into his hands. In 1174 the battle of Paniput was fought in which the Mahrattas were utterly defeated. It will thus be seen that this invasion occupied about two years, the 14th and 15th of Ahmad Sháh's reign. Coins Nos. 8—13 of my plate exemplify this period. They all have the Persian couplet on their obverses. The reverses are as follows:—

No. 8. *Reverse:*— جلوس میمنت مانوس سنه ۱۴
ضرب انوله

Aonlah is a town of Rohilkand on the railway between Barellí and Chandausí.

No. 9. *Reverse:*— جلوس میمنت مانوس سنه ۱۴
ضرب مرادا باد

This coin is the property of W. Theobald, Esq. of Bedford.

No. 10. *Reverse:*— جلوس میمنت مانوس سنه ۱۴
ضرب دارالخلافه شاه جهان آباد .

No. 11. *Reverse:*— جلوس میمنت مانوس سنه ۱۴
ضرب انک

No. 12. *Reverse:*— جلوس میمنت مانوس سنه ۱۴
ضرب بریلی

No. 13. *Reverse:*— جلوس میمنت مانوس سنه ۱۵
ضرب سهرند

Sarhind is always spelt on coins Sahrind. The obverse of this coin is dated 1174 A. H.

Besides these coins which I have drawn I have Lahore, 14th, 1173; 15th, 1175; Sháhjahánábád, 15th, 1174; Lahore, 16th, 1175; 16th, 1176; Sahrind, 16th, 1175. Mr. Theobald has one struck at Farrukhábád during this period.

Ahmad Sháh disappeared from India immediately after the battle of Paniput. He left governors in Sarhind and Lahore. The Government at Dehlí was impoverished and powerless. The Sikhs who under all the changes of government had bided their time, plundered, fled away, grown rich and numerous, began again to assume power. They built a fort at Gujránwálla. They defeated the governor of Lahore.

They troubled the governor of Sarhind. They laid siege to the town of Jandiála, 11 miles from Amritsar. It was this last matter which brought Ahmad Sháh again on the scene.

They say that one night Ahmad Sháh was in a quiet sleep, all at once in the middle of the night he woke up, and ordering his body-guard of 300 horse to attend him, he took his way towards India. He ordered his Aid-de-Camps to tell the prime-minister of his departure, and to get the whole army ready and follow him with the greatest expedition. Ahmad making double marches was soon in the neighbourhood of Lahore, but with him were only 10 or 12 horsemen. Meeting with a peasant he asked him where the Sikhs were. He was told that to the number of 70,000 they were encamped before Jandiála. Hearing this he departed at once for Jandiála. The besiegers when they heard of Ahmad Sháh's arrival at once fled. The besieged could not understand it. They sent out spies to see if it were a trick of the Sikhs to draw them out of their fortifications. The spies reported that they could see nothing of the enemy. But under a tree about two kos away, they found a man sitting under a canopy. Some ten or twelve armed attendants were with him and were treating him with the profoundest respect. When the governor of Jandiála heard this, he at once knew that it was Ahmad Sháh who had come to his relief. He went out to thank his Sovereign and was received with kindness. Soon after the general arrived with the Afghan army. The general biding his time as Easterns always have done and do still, asked Ahmad Sháh why he had left Kábul so suddenly. He answered that as he was sleeping Muhammad had appeared to him, and told him of the siege of Jandiála and the distress of the besieged, and had ordered him to start at once to relieve the town. So trusting in God he had started leaving orders for the army to follow him.

After staying a few days at Jandiála, Ahmad Sháh crossed the Bías and Sutlaj, and defeated the main body of the Sikhs who were just about to commence an action with his governor of Sarhind. This action known as the Ghuloo Ghára, or great disaster, took place about 20 miles south of Ludiana. The founder of the present Pattiála family was among the prisoners. "He was declared a rája of the State and dismissed with honour."* I shall refer to this further on. Ahmad Sháh "the very ideal of the Afghán genius, fitted for conquest, yet incapable of empire" immediately returned to Kandahár. He never attempted to improve a victory or govern a country he had conquered. This incursion took place in the year 1176 A. H. The Sarhind coin I have mentioned above, seems to illustrate this period. It is of his

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* Cunningham's History of the Sikhs, p. 101.

16th year. The year is 1175. But that must be a mistake. However the Lahore coins go on steadily. One of the 17th year is dated 1176, another 1177 A. H. One of the 18th year has 1177, another 1178; a 19th year one has 1178. The Dehlí and Dúáb coins cease. Ahmad Sháh no longer ruled there. 1178 A. H. is equal to 1764 A. D. which is equivalent to 1821 of the Samvat era. Now in 1822 A. S., the Sikh commonwealth struck their first rupees of Lahore. (See my Coins of the Sikhs.) Hence we shall not expect to find any rupees of the 20th year of Ahmad Sháh struck at Lahore, I have sought in vain for one of this year. After the 16th year, the Cis-Sutlaj coins cease.

After the Ghuloo Ghára Ahmad Sháh, on his return through Lahore, made Kábulí Mull his governor there. Zein Khán had been left governor of Sarhind. He was defeated by the Sikhs with immense slaughter. The town of Sarhind was utterly destroyed. The Sikhs actually carried their victorious arms into the Dúáb. It was this loss of Sarhind which brought Ahmad Sháh again to India in 1178 A. H. No very accurate account seems to exist of this incursion. It seems it was not a success. "12,000 Afgháns suddenly deserted and retraced their steps towards Kábul. The Sháh was obliged to break up his camp and follow them."* He never returned. This last incursion took place in his 18th year. The Sikhs seizing Lahore struck coins there first in 1822 A. S., as I have shown. I have seen rupees of theirs struck at Lahore in 23, 24 and 25. And yet their rule could not have been uninterrupted, for I have a rupee of Lahore of Ahmad Sháh struck in his 21st year and 1180 A. H., also one of his 22nd year is in the British Museum.

No. 14 of my plate contains the following reverse:—

ضرب دیرة سنه ۲۲

Dera I have seen on some coins changed to Deraját. This is of course the Trans-Indus Province. I have in my cabinet a coin of Ahmad's 25th year struck at Pesháwar. It was to this part of India his rule was restricted before he died.

The coin No. 17 is a modern Puttiála rupee presented to me by the foreign minister of the State. It has on the obverse the whole of the couplet of Ahmad Sháh who created the 1st Máháraja of Pattiála. On the reverse there is the same inscription as on No. 13. The mint is Sarhind. The katár or dagger is the sign of the present Mahárája. As a rule the rupees of this State are thick and dumpy, consequently they never have more than a third of the inscription on them. They are about the same in diameter as a four-anna piece and about 4 times as thick. This is the only thing in India to remind us that Ahmad Sháh invaded this country no less than seven times.

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* Kángra Settlement Report by G. Barnes, Esq.

Thus I have shown how coins illustrate the history of one of the conquerors of India. Never have I been able so well to illustrate the Persian line :—

هرکه شمشیر زند سکه بنامش خوانند

" People read coins in the name of every one who smites with the sword."

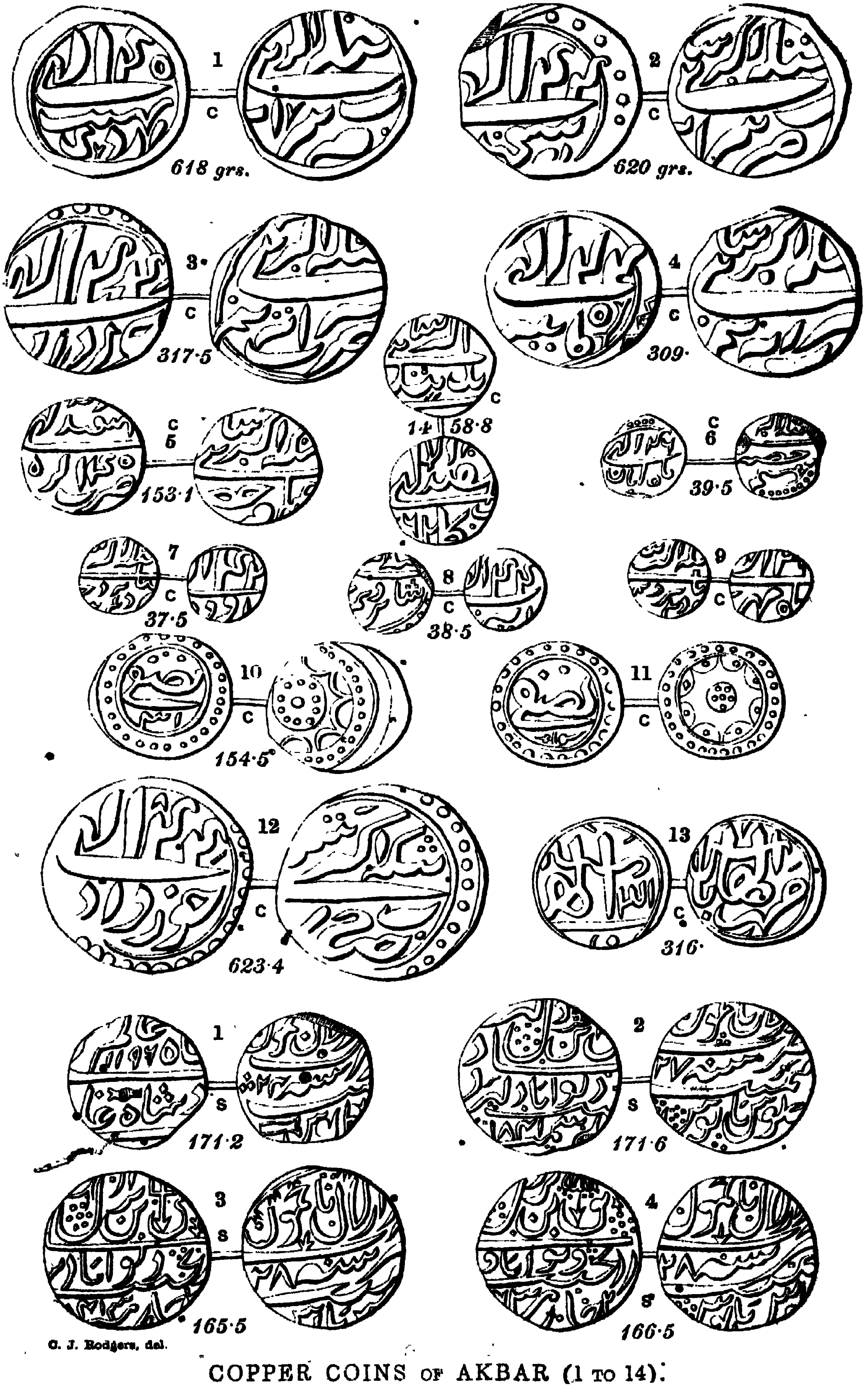
We have seen how Ahmad Sháh of Dehlí and Ahmad Sháh Durrání struck coins in the same year in the same places, as did also Álamgír II, and the Durrání. Sháh Álam II never coined in any trans-Sutlaj province. Coins were struck by Ranjít Deo in Jummoo in his name. But no rupee of Lahore or Multán with the name of Sháh Álam II has yet been found. The Sikhs became absolute masters of their own land, and all throughout the years of the long reign of Sháh Álam II, kept the mint at Amritsar, Lahore and Multán fully employed in striking coins in praise of Nának and Gobind Singh.

The numbers under the coins show the weight of each in grains.

List of Errata.

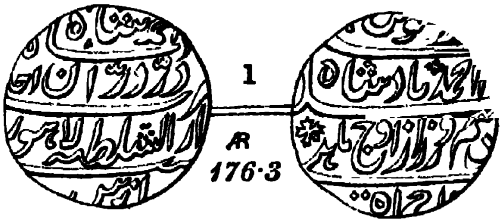
p. 22, l. 9, *read* सिर मँ बसि
p. 28, note*, *for* on *read* in.

Journ As. Soc. Bengal, Vol. LIV, Pt. I. for 1885 PLATE I.



C. J. Rodgers, del.

COPPER COINS OF AKBAR (1 TO 14).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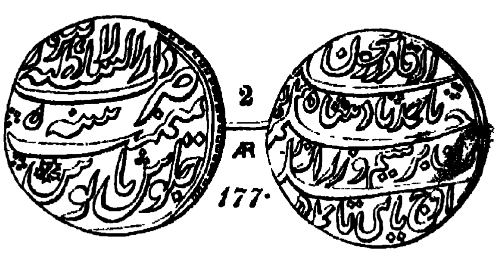
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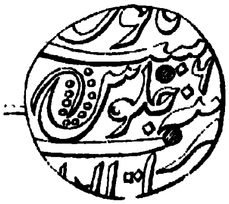
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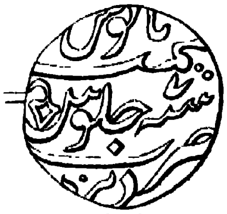
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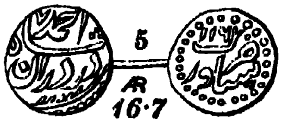
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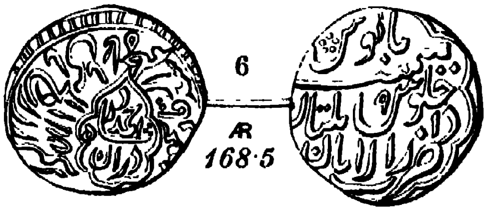
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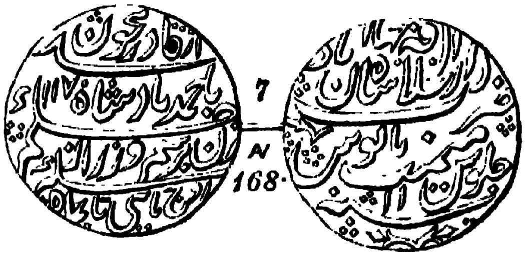
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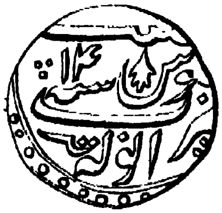
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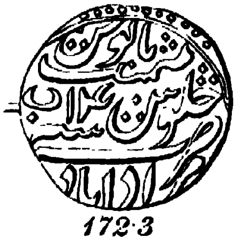
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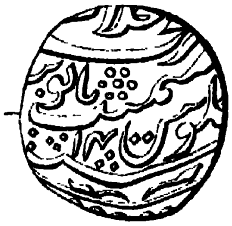
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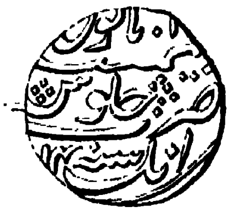
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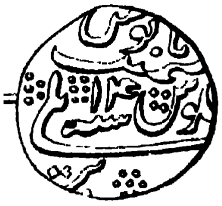
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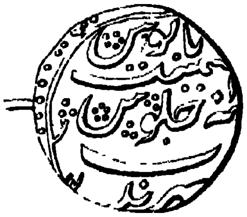
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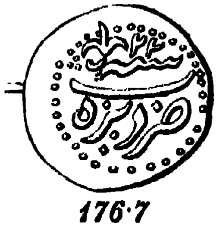
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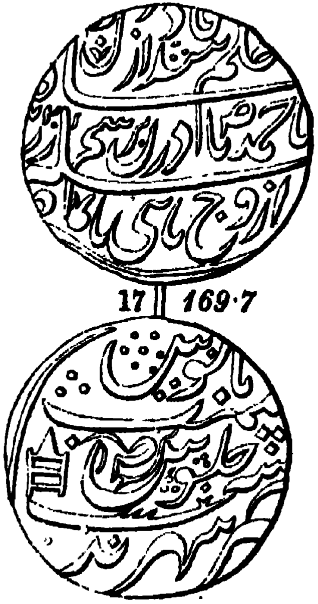
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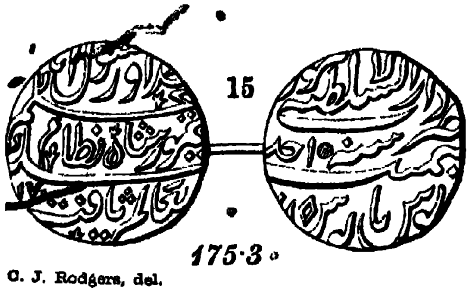
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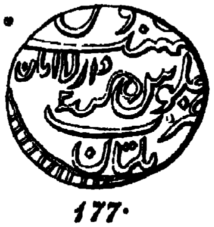
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C. J. Rodgers, del.

COINS STRUCK IN INDIA BY AHMAD SHAH DURRANĪ.

JOURNAL

OF THE

ASIATIC SOCIETY OF BENGAL.

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Part I.—HISTORY, LITERATURE, &c.

No. II.—1885.

On the Trishṭubh Metre.—*By* J. Boxwell, B. C. S.

The rich variety of rhythm that lies in eleven syllables has given form to musical poetry among many Aryan peoples through many ages. The earliest of these hendecasyllabic metres, the Vedic Triṣṭubh, on analysis yields interesting results, and discloses curious affinities to others of the group. Professor Max Müller it is true, proves almost any structure admissible in Vedic metres. But they are not to be judged like the Greek tragic senarius, which is Sanskṛit in the highest sense, carefully perfected. Any structure found in Sophocles is good, be it rare or common. Vedic metres are rough; by no means polished to perfection. But their music is clear; and analysis shows us, not exactly what is admissible and what is not, by a division line; but, by comparative frequency, what rhythm the Vedic poets sought.

Acknowledging gratefully the vṛitta of the final three syllables, I think for scansion it is better to divide the traishṭubh into an initial and final quadrisyllable, and a medial trisyllable. As we might expect, rigour of structure increases from the beginning towards the end. The form is usually given × × × × × × × — ◡ — × : or even × × × × × × × × ◡ — × ; but I hope to show that there is a very strong tendency in a particular direction; and that on this tendency much of the peculiar effect of the traishṭubh depends.

The final quadrisyllable is the most firmly fixed. Even in the 8th syllable there is only a trace of irregularity. The regular traishṭubh ends in a ditrochee.

Although the 7th and 5th show separately no tendency to fixity, they seem to be bound up closely by a law with the 6th, which is short in more than 90 per cent. of cases.

The rule for the middle trisyllable is this :—

— ◡ ◡ ... 30 per cent. }
◡ ◡ — ... 30 per cent. } together 81 per cent.
◡ ◡ ◡ ... 21 per cent. }
— ◡ — ... 10 per cent.

As there are 8 possible trisyllables; that 3 of them should give 81 per cent., and that in 91 per cent. of cases the middle or 6th syllable should be short, proves design or rather feeling for the particular effect.

The initial quadrisyllable shows a tendency almost as strong. Of 16 possible feet,

— — ◡ — gives 24 }
◡ — ◡ — „ 22 }
— — — — „ 13 } 72
◡ — — — „ 13 }

that is Alcaic and quasi-Alcaic openings yield 72 per cent., while the 12 other possible openings between them give only 28. The favourite cæsura is that which corresponds to the classical penthemimeral. The typical traishṭubh is thus × — ◡ — | — ‖ ◡ ◡ | — ◡ — × ||| or a combination of Alcaic opening with Sapphic close, a line of great sweetness and dignity.

The first stanza of the horse-sacrifice hymn, 163 of the first book of the Ṛig Veda is a very perfect example;

Yad akrandas prathamam jáyamánas,
Udyan samudrát uta vá puríshát,
S'yenasya pakshá harinasya báhú
Upastutyam mahi játam te arvan.

It may be rendered into Latin in the same metre and structure;

Quis hic jam nunc fremitum natus edit ?
Pontus-ne talem, genuit-ve nubes ?
Dat vultur alas tibi cervus armos.
Deûm gentem, Sonipes, te fatemur.

The recognized hendecasyllabic metres of trochaic ending are—

1st. English iambic trimeter catalectic.
2nd. The Italian heroic line.
3rd. The hendecasyllabic of Catullus.
4th. Certain lines of Pindar.
5th. The Sapphic line.
6th. The trishṭubh.

To these I add the Alcaic stanza for the following reason: Two lines have eleven syllables each. Two lines including the last have the characteristic trochaic ending. The first three Alcaic lines open in the same manner as about half the traishṭubhs in the Ṛig Veda; and the dactyls of the first, second and fourth lines have very much the effect of the dactyls and anapæsts which so constantly form the second or middle foot. That this division into classical feet is not unsound is shown thus. The law of syllabic length might be thus provisionally stated, 1 being practical certainty and the decimal showing the approach to certainty.

11th	syllable	common.	
10th	,,	—	1·0
9th	,,	⏑	1·0
8th	,,	—	1·0
7th	,,	×	
6th	,,	⏑	0·9
5th	,,	×	
4th	,,	—	0·8
3rd	,,	⏑	0·58
2nd	,,	—	0·8
1st	,,	×	

But it has been shown that the 5th and 7th are not separately and independently indifferent like the 1st or 3rd. If either 5th or 7th is long, the other is almost always short; and in the rare instances of 5th and 7th long together, the 6th, already very steadily short, is so persistently short that a molossus may be considered inadmissible as middle foot. It is this quality of the middle foot which seems to me to give character, second only to the trochaic close. The fact that the 6th syllable, and with it either the 5th or the 7th, will be short, produces what I can only call a ripple or break, causing flexibility and variety.

The trishṭubh metre supplies examples of almost all the other lines from the tame English iambic to the quickest Sapphic. And indeed Shakespear's iambics and Dante's heroics contain many veritable traishṭubhs. The lines may be set in a scale.

'Tis certain greatness, once fall'n out with fortune.	Tatas dadáti dáśushe vasúni.
Αἰολίδαν δε Σίσυφον κελοντο.	Púrṇagabhastim ilate supáṇim.
Vitam quæ faciunt beatiorem.	Codat rádhas upastutas cit arvák.
Per me si va nella cittá dolente.	Indram naras nemadhitá havante.
Κλεαν[illegible]τις ἀλικίᾳ τε λύτρον.	Tuam ha tyat, Indara, Kutsam āvas.
Καὶ γὰρ αἰ φεύγει, ταχέως διώξει.	Gobhir açwebhir vasubhir nirṣṭas.
Αἰ δε δῶρα μὴ δέκετ', ἀλλὰ δώσει.	Gomat açwavat rathavat viantas.

I have attempted to translate into Latin two fine odes from the 3rd and the 10th books; one into Sapphics, the other into its native metre in a Latin dress.

Ṛg Veda III. 33.

Segnius nituntur equæ volantes
Carcere effusæ rapiuntque currus;
Sic boum matres subolem tumentes
Ubere lambunt;

Ut tument pronæque Vipax Cytudris
Montium divo duce claustra rumpunt:
Deinde conjunctos sociare gaudent
Ad mare cursus.

Advenam me ripa sacræ Vipacis
Arcet invitum, geminusque gurges.
Ceu boves undæ ad mare mugientes
Ire videntur.

Flumine hoc pingui Deus ire jussit.
Quærimus matris gremium, neque ullis
Flectimur surdæ precibus. Quid audax
Vult sibi vates?

Rite libantis mea vota nymphæ
Audiant; natus Cusico precatur.
Vos brevem tardare velitis horam
Flumina lapsus.

Quo Deus ducit sequimur. Malignum
Fulmine occisit simul Indrus anguem,
Atque iter claustris penitus refractis
Pandit aquarum.

Splendeat nomen magis illud Indri
Indies. Pestem Arcitenens peremit;
Haurit et gratos cohibente nullo
Alveus imbres.

Quod canis sis tu memor ipse fati.
Ultimum has voces iterabit ævum.
Ne velit frenare deas amœno
Carmine vates.

Post tot erratus precor o sorores,
Gurgitem currus date mitiorem
Transeat, vestris mihi neu madescat
Fluctibus axis.

Post tot erratus precibus movemur.
Transeat currus, cecidere fluctus,
Nupta succumbit nova ceu marito,
Sic tibi cedam.

Trans aquas te Diva jubente et Indro
Duxerint postquam Barati cohortes;
Œstuat flumen; veniam ipe supplex
Numina poscam.

Occupant ripam Barati feroces,
Nactus et vates veniam dearum.
Ite nunc amnes solitosque læti
Volvite cursus.

Ṛg Veda X. 108.

Quid est cur has Sarama visat oras?
Longinquum nempe est iter arduumque.
Quid opus nobis tibi? Quo vagaris?
Qui tu Rasam poteras transilire?

Indri videtis famulam. Repostos
Quæro thesauros Panium latebris.
Ne jussa fallam timor urget instans,
Rasæ vada hinc poteram transilire.

Qualis et quantus, Sarama, Indrus ille,
Tibi qui longum hoc iter imperavit?
Quin huc venit? Hospitium paramus.
Boumque nostrorum erit ipse custos.

Nulli captandus capit alterum ille,*
Mihi qui longum hoc iter imperavit.
Non illum immane latuit profundum.
Vos fulgure Indri percatis usti.

Quas tu boves Sarama, vis redemptas
Errant fugaces per operta cœli.
Quis impune abripiat? inscius quis
Sperat se Panes habiturum inermes?

---

* Sarama could hardly tell the Paṇis she had never seen Indra, and to say that he would conquer the conquerable is a little flat. I have taken nâham tam veda dabhiam together; "I have not seen him in-such-case-as-to-be-out-manœuvred" and then dabhat sa "it is he who will win."

Voces valent nil Panium minaces.
An membra telo geritis scelesti
Figenda ? Patent aditus ad arcem.
Vestrum Patrem misereat Supremum.

Conditam saxo retinemus arcem
Boumque plenam Sarama, atque equorum.
Eam Panes vigilantes tuentur.
Vanum tibi hoc est iter irritumque.

Vos o superna numina invocata
Factis sacris propitia huc adeste.
Raptas boves restituant latrones.
Respuant Panes animum hunc superbum.

Faventibus Sarama freta divis
Ausa es ad nostras penetrare sedes.
Ne redeas ; te faciam sororem.
Boves optatas tibi partiemur.

Ego nec fratres neque vos sororem
Novistis, Indrus superique testes,
Qui me boves vehementer reposcunt.
Panes abeste pro cul hinc profani.

On certain symbols or devices on the gold coins of the Guptas.—*By* W. THEOBALD, M. N. S. L. *Bedford, November*, 1884.

The following remarks have resulted from the perusal of an interesting and instructive paper on the Gupta coinage by V. A. Smith, Esq., published in the Journal of the Asiatic Society of Bengal, Part I, for 1884.

The idea now advocated may have doubtless occurred to others who have made the Gupta and Indo-Scythian coins their study, but it does not appear to have been published, nor is it in any way alluded to by Mr. Smith in his paper on these coins.

The three symbols referred to are the 'fillet' and the 'cornu-copiæ' as they appear on the Gupta coins, as contrasted with similar symbols on Bactrian, Indo-Scythian and other coins, and the 'footstool' which occurs on both the copper and gold Gupta and Indo-Scythian coins, beneath the sealed figure of 'Ardochro,' and it is for these two latter symbols or devices, that a new, and it is believed a more correct interpretation is now offered.

THE GUPTA 'FILLET.'

The object to which the term 'fillet' has been applied and which Prinsep and Kittoe term a 'noose' is common not only on the Gupta coins, but on a variety of others, notably the Indo-Scythian of probably in part cotemporary date. Mr. Smith retains the term 'fillet' for this object "for convenience" but adds "in many cases I believe it would be more proper to follow Prinsep in calling it a '*paśu*' or noose." The question whether the term 'fillet' be used or 'noose' may not seem of much importance so long as the objects alluded to are believed to be identical, but should this be otherwise, then it it is clearly desirable not to unical one, by applying to it, a name properly applicable only to the other. It is moreover an instance of an error, simpler perhaps or minor in degree but identical in kind with another to which attention will presently be invited. It may be perhaps urged, that on coins of quasi-coarse execution like the Gupta coins, little weight can attend to the precise form of the symbol, and that the object thereon may form its general aspect be considered as copied from the more artistic 'fillet' or wreath, of Greek art, but admitting this, we are all the more thrown back, in our efforts to determine the precise significance in this particular case, of the object or symbol represented, to other data, and more general reasons than those afforded by the distinctive or artistic treatment of the symbol itself.

Not to carry the discussion further afield than India, and the country subjected to the Bactrian and Indo-Scythian kings, it may be observed that the 'fillet' or 'wreath,' (for in numismatics, the wreath is a more artistic and florid variation of the fillet, *quoad* the symbolism involved) occurs on coins in five distinct positions. 1st, In the hand of Nike or Victory, as in those of Azas and Vonones. 2nd, Encircling the king's head. 3rd, On a standard, or 'javelin' and called a staff, carried by the King or Priest, as in many Indo-Scythian coins. 4th, Either on the head or in the hand of the figure on the reverse of some Bactrian and many Indo-Scythian coins. 5th, Occupying the reverse of some Bactrian coins as in some of Antimachos.

In all of these instances it is clear that one and the same symbol is intended, representing one and the same idea, *e. g.*, paramount power, crowned by the symbol of paramount holiness. This symbol was of course the old 'fillet' or '*vitta*' of classic times the *vitta tenuis, insigne pudoris*, as Ovid calls it, the outward sign, whether borne by king, woman, or priest of power and purity.

On the reverse however, of the Indo-Scythian coins, we find such an intrusion of personages from the Hindu pantheon as renders caution necessary in accepting the same symbol, or what might be regarded as the same symbol, as indicating the same or any approximately similar idea, and we find ourselves carried back rather to the worship of Isis, than that of Vesta. In support of this view it seems almost sufficient to adduce the fact of the appearance on these coins of S'iva, under the name of Okro, with either two or four arms and one or more[*] heads, and with his appropriate '*vahana*' in attendance, the bull Nandi.

Now the 'noose' in the hand of S'iva, can hardly with reference to that deity's functions and character be regarded as having any symbolical connexion or reference to the 'fillet' on Greek or Roman coins, but rather as representing a phallic symbol, appropriate enough in the hand of the Indian Siva or his consort or 'S'akti,' the tender Párvatí, or the formidable Durgá. But admitting that the symbol of the 'noose' is no longer the same as the 'fillet' when met with on the Gupta or some Indo-Scythian coins, it must not be inferred that it is exclusively a symbol of S'iva, as it is also borne on some Gupta coins by a goddess, who is probably, as Mr. Smith maintains intended for Lakshmí, the consort of Vishṇu, as indicated by the lotus throne whereon she is seated. Whilst therefore in the hand of the goddess seated on a lion, the symbol represents the 'noose' or '*paśu*' of S'iva, in the hand of his 'śakti' Párvatí or Durgá, yet when it is borne by the goddess throned on a lotus, it probably represents a female anthem homologous with the *sistrum* of Isis, and typical of the fruitfulness whereof Lakshmí is the dispenser and fountain head. Indeed it is curious, should the view presently to be developed with regard to the 'cornu-copiæ' be accepted, that both symbols carried by the goddess, variously seated on a lion, throne, or lotus on the reverse of the Gupta coins, should be equally appropriate, whether such goddess is supposed to represent Párvatí or Lakshmí.

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[*] It is usual to speak of the polycephalic S'iva, as three-headed or three-faced, but this view is hardly supported by the coins, or any necessity of Hindú mythology. On the coins, this form of S'iva or 'Okro' is represented not as though it were the artist's intention to represent three, but rather four heads or faces. What is depicted is, a full face in front flanked by two faces in profile, and with obviously room behind for a fourth face such an ideal figure corresponding very exactly with the well-known four-headed 'linga.' See for example fig. 26 in the Plate of Indo-Scythian coins in 'Jainism' (E. Thomas) which type is also occasionally met with on the copper coins of Ooerki with the king on the obverse seated on a couch, with one leg uplifted thereon. Now S'iva though a polycephalic deity, is not one whose mythological attributes, like Diana's "Tria virginis ora Dianæ" necessitate a triform conception of his person, and therefore the image on the coins of Ooerki and Bazdeo may fairly be regarded as representing not three but four heads. Had the artist wished to represent the god in a triform shape, he would have produced a figure resembling that of Janus, with two faces, neither of them in full profile, but this he has never attempted.

The above considerations therefore lead to two inferences: 1st, that the 'noose' symbol on the gold Gupta coins, represents wholly different ideas from those symbolised by the 'fillet.' 2nd, that the 'noose' symbol on these coins, is of ambiguous import, and that it represents indifferently the 'noose' of Śiva when borne by a goddess, whom we have other reasons for regarding as his Śakti, whether under the form of Párvatí or Durgá; or when it is borne by a goddess presumably identified with Lakshmí, it is then no longer the '*paśu*' of Śiva but a feminine symbol, analogous to the '*sistrum*' of Isis, and that it is by collateral indications only that it can be decided in which sense, in each case this symbol is to be construed. See Inman's Ancient Faiths embodied in Ancient Names, Vol. I, p. 527.

Having thus considered the probability of two symbols of entirely different significance being united or confounded under the term 'fillet' it remains to see if another and more interesting example of this union, and the resulting observation or blending of the ideas, is not afforded by the 'cornucopia' as it is termed, on the Gupta coins, and if an exotic symbol is not in this case also made to do duty for a different and peculiarly native idea.

THE GUPTA 'CORNU-COPIÆ.'

It may be granted at once that the 'cornu-copiæ' on the Indo-Scythian coins is exotic in its design, and copied probably from Roman coins of the period. The idea too is doubtless the same, and, as on Roman, so on Indo-Scythian coins the 'cornu-copia' is the symbol of good fortune, prosperity and abundance. This classic type of this particular symbol is seen on coins figured in Ariana Antiqua, Pl. XX, figs 4 and 5, and also on the plate of coins in Jainism (Edward Thomas) fig. 16. In one gold coin of Ooerki, in my possession, the classic idea of the 'cornu-copiæ' brimming over with the kindly fruits of the earth is well displayed, and on either side project, what are clearly intended to represent corn-ears. Generally, however, the treatment is more conventional, though in every instance it would seem as if fruits or corn were the objects intended to be understood as filling the 'horn.' So far as I know, the 'cornu-copiæ' is always borne, on these gold coins by the goddess Ardochro, standing. In the Pesháwar find there were several of such coins and one with the legend of Mioro (No. 49 of Catalogue) but whether with the usual standing figure of a goddess is not quite certain, though such is probable from the wording of the catalogue. In copper coins, however, of Ooerki, of the elephant and rider type, the 'cornu-copiæ' though usually carried by the goddess Ardochro, is also occasionally seen in the hand of Mao. Now the name Mao on these coins, is generally applied to a male deity, whom the crescent moon behind his shoulders proves to be the masculine moon, the Deus Luna, or 'Soma' of the Hindús. But on those coins whereon the 'cornu-copiæ' is borne by Mao, the deity is feminine and without the crescent moon behind her shoulder, or in other words the title Mao is occasionally bestowed on the deity usually named Ardochro.*

In every single instance that has come under my observation, the 'cornu-copiæ' on the Indo-Scythian coins in gold or copper of Ooerki, Kanerki, or Bazdeo, though various in design, never present the peculiar type which it assumes on the Gupta coins, neither is the peculiar type of the Gupta cornu-copiæ ever represented that I am aware of on either the gold or copper coins of the ordinary Indo-Scythian mintage, though seen in some coins of a different type classed by Wilson with the Guptas: A. A. Pl. XVIII, fig. 25 and by Mr. Smith as Indo-Scythian, one being figured on his Plate IV, fig. 6. Prof. Wilson (A. A. p. 427) describes these as "rude coins" and so perhaps many of them are; but two in my possession attributable to 'Bri Shaka' and 'Sita,' are as well designed and as clearly cut and stamped as the bulk of the Gupta coins, though displaying a stiff and formal mannerism quite distinct from either the Gupta coins on the one hand, or the Indo-Scythian on the other.

On the copper coins the 'cornu-copiæ' is either entire, or bifid at the top. In all the specimens I have seen of the 'cornu-copiæ' borne by Mao, it is distinctly, and sometimes deeply bifid, whilst the same symbol on the copper coins whereon Ardochro is figured, is entire at the top. This, however, is not a distinctive character, as on the gold coins Ardochro is represented bearing both types of the symbol. In A. A. Pl. XII, fig. 5 and Pl. XIV, figs. 4 and 5, the undivided type of cornu-copiæ is figured and this is certainly the commonest form, but a gold coin of Ooerki figured by Thomas (Jainism, Pl. 11, fig. 16) the cornu-copiæ is distinctly bifid, though not to the same extent as is seen on the copper coins with more on the reverse, and I have a very similar gold coin with the 'cornu-copiæ' distinctly though not deeply bifid. It is not from the same die as that figured by Thomas, as the 'nimbus' is complete, whereas on the figured coin it is only represented on front of the king's face.

The 'cornu-copiæ' (as it is called) on the Gupta coinage differs considerably from either type of the symbol on the Indo-Scythian coins, and this difference is too constant and circumstantial to be the result merely of accident or inferior execution. On this point Mr. Smith pertinently remarks: "The suggestion that the figure of the Ardokro goddess was adopted by Samudra in mere imitation of a foreign design does not appear tenable. The coins with this reverse undoubtedly show evident traces of foreign influence, but they are far from being mechánical copies of alien design."

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* On another of these copper coins of Ooerki, Mao is also represented as a male figure with nimbus, and no crescent behind the shoulders, but with the emblem of Vulcan; in his right hand a hammer, with a small handle (like the bamboo handle of an Indian smith's hammer) and in his left, resting against his shoulder, a pair of pincers precisely like those now used in an Indian bazaar by an iron-smith.

If this view is correct, as is probably the case the question arises, whether this constant difference in type of the 'cornu-copiæ' symbol which is found to exist on the Indo-Scythian and Gupta coins respectively, does not mark a corresponding divergence of ideas, represented respectively by each type of the 'cornu-copiæ' symbol? That such is the case with the 'fillet' there are, as has been shown good grounds for supposing, and in like manner a close examination of the Gupta 'cornu-copiæ' suggests that the idea it represents is entirely different from that of plenty and abundance, and that it stands really for, and in an adoptive and conventional mode of representing the native object of symbolical worship, the snake or Nága.

The point wherein the 'cornu-copiæ' symbol on the Gupta coins, diverges from its classic prototype on the Indo-Scythian coins is this, that whereas the latter has always the appearance of a receptacle stored with the kindly fruits of the earth, among which, in the best executed examples, heads of grain may distinctly be recognised, the Gupta symbol is closed above by a more or less convex line ornamented by a variable number of approximately equal and equidistant pellets or dots. Now bearing in mind that the symbol may be intended for the divine Nága, it is by no means an undue stretch of the imagination to regard these pellets as a conventional mode of representing a polycephalic Nága, whether we regard each pellet as corresponding to one of the heads or a mere jewel or ornament indicative of as many heads as pellets. Of the coins figured by Mr. Smith on Pl. II, fig. 3 displays 5 pellets, figs. 3, 7, 8, show 7 pellets and figs. 1 and 11, 8 pellets and similarly in the figures given in A. A. Pl. XVIII, the number of pellets ranges from 5 to 8.

It yet remains to connect this Gupta 'cornu-copiæ' with the Nága and though Mr. Smith does not allude to any such idea yet both his own Plates and Plate XVIII of the Ariana Antiqua furnish on close examination sufficient evidence to establish this rather startling conclusion. In A. A. Pl. XVIII, fig. 6 the curved body of a snake is indicated on the right hand side of the figure, the entire animal being above the couch or throne whereon the goddess is seated. In fig. 8 of the same Plate, the body of the snake seems to pass behind the back of the goddess and come out in front of the right instep whence it curves up over the left knee, the tail resting on the throne. In fig. 9 a somewhat similar arrangement is seen though not quite so clearly made out. Turning now to Mr. Smith's paper, the first coin suggestive of a serpentine termination of the 'cornu-copiæ' symbol is fig. 3 of Pl. II. The snake's body in this coin comes round to the front, crosses the lap of the goddess and depends on one side from the left knee. This is not clearly to be seen on the plate, but is very distinct on a fine coin of the same type in my possession. In fig. 6, Pl. III, the goddess is represented sitting on a lion, and is described in the text (Page 186) as holding a flower in the left hand. Now this object is very unlike the flowers seen on other Gupta coins, as for instance in figs. 7 and 8 of the same Plate and in figs. 1 and 10 of Pl. II, and is with greater probability intended for a snake with distended hood, displayed on a level with the head of the goddess, a distinct fold of the snake's body being very distinctly seen in contact with the left knee. In some figure a sort of loop in this position may be held to represent the loose sleeve of the goddess, but in the present instance, it cannot possibly be thus explained, nor does there seem to be any alternative explanation to that now proposed.

Another indication of the true nature of the 'cornu-copiæ' symbol borne by the Ardochro goddess on the Gupta coins is in the object seen at her feet. Of this Prof. Wilson thus speaks (A. A. Page 423). "Instead of the lotus also, and the Indian mode of being seated, the female is often represented as sitting on a high-backed chair, with her feet on a footstool." Now this 'Ardochro footstool,' so called, can only be so regarded, not because it bears any distinct impress of anything of the sort, but because it was plainly intended by the artist to represent something; and being at the feet of the goddess, a stool seemed a probable conjecture. But the stool so called, is simply the portion of a circle, and the execution of the coins is such as to render the idea wholly untenable that the artist lacked the ability of giving some closer resemblance to a 'stool,' to the object in question, had such been his design. The addition of only a few rough lines and cuts on the 'die' would have left no doubt, that a 'stool' was what the feet of the figure were reposing on; as it is, the feet are simply encircled with a line, the area enclosed by which being ornamented with pellets or dots. The coins figured, in A. A. Pl. XIV, figs. 19, 20, 21, and 22 support this contention, that it is not from want of artistic capacity that the so-called 'stool' is so very imperfect a representation of the object specified.

If on the other hand the 'cornu-copiæ' symbol is regarded as a conventional or covert representation of the 'Nága' or snake, then the 'stool' so called, at the feet of the goddess, at once resolves itself into the terminal coil of the monster's body, vindicating the powers of the artist from the reproach of inadequately representing what it was his intention to convey.

Supposing this interpretation of the 'footstool' so called is accepted, then the dotted area whereon the feet of the goddess rest; will represent the solid earth bounded or encircled by a fold of the mystic snake or Nága, whose presence is equally appropriate and in union with Hindú feeling, whether the symbol be regarded as introduced in honour of S'iva or Vishṇu, or to please the votaries of both.

There is an objection which might be raised, with reference to Pl. II, fig. 3 to the identification of the 'footstool' so called with the terminal portion of the snake's body, of which the cornu-copiæ represents the expanded hood, and that is that on the coin alluded to, the extremity of the tail of the snake is seen recurved over the left knee of the goddess, though the 'footstool' is also seen at her feet.

As previously remarked, however, a coin in my possession whilst displaying very clearly the tail of the snake as indicated in the Plate, offers a somewhat different treatment to that usually seen on both gold and copper coins, of the so-called 'footstool,' and this slight alteration in design, is no doubt caused by the very fact in question of the tail of the snake represented by the cornu-copiæ, being in this instance visible to its termination. Usually the tail is so arranged as to allow of the 'footstool' being considered as a terminal fold of the snake's body; in the case under consideration that is not so, and a slight but important modification is introduced which though present in the figured coin is still more clearly displayed on the finer coin in my possession. Usually the Ardochro footstool is represented by an oval line, bounded in part by the drapery of the figure, and which would very well represent a footstool if only some indication of legs were added. In my more perfect coin, the oval is incomplete, a clear space intervening between the ends and the drapery; in other words, it is no footstool which lies at the feet of the goddess but a curved snake. The coin is too well executed and in such preservation, that there is no room to doubt that such was the intention of the artist, and nothing but a foregone conclusion could allow of any doubt but that the cornu-copiæ on this coin represents one snake and the 'footstool' another.

On some less artistic examples, the line representing this snake is double, and it is not clear whether we are to regard this duplication, as representing a second snake, or as merely the result of inferior execution, my own impression strongly inclining to the latter conclusion.

A coin in my possession, procured in the Panjab, with the name 'Sita' on it, and of precisely the same class of coins as that figured by Mr. Smith, Pl. IV, fig. 6, proves that a similar interpretation of the 'cornu-copiæ' symbol can be applied in their case also. This is not clearly seen on the figured coin, as what is really the snake's body, there appears as what might be the sleeve from which the arm of the goddess protrudes, but on my more perfect coin, the sleeve or cuff appears as a fold above the loop which would seem to be intended as a fold of the snake's body, round the arm of the goddess, with the extremity of the tail just visible on her left knee.

In support of the views here put forth reference has only been made to coins in my own cabinet or those figured in the 'Ariana Antiqua,' Mr. Thomas's 'Jainism or the early faith of Aśoka,' and Mr. Smith's paper, all works readily accessible to the Indian reader, but an examination of the fine series of Gupta coins in the British Museum, strongly bears out the fact of the Gupta 'cornu-copiæ' being (by its mode of representation on the best samples) a conventional symbol of the 'Nága' and the only point I cannot explain satisfactorily to myself, is how this very obvious interpretation has hitherto escaped the notice of the many far abler antiquaries than myself who have studied these coins; for once enuntiated, the idea seems almost as obvious, as the celebrated problem of the egg propounded by Columbus.

The Square Silver Coins of the Sultáns of Kashmír.—*By* Chas. J. Rodgers, M. R. A. S, *Member of the Numismatic Society, London, and Associate Member of the Asiatic Society of Bengal.* (With 3 Plates)

When I wrote my small paper on "The Copper Coins of the Sultans of Kashmir" I mentioned the fact of my possessing square silver coins of five Sultáns. The publication of my papers on the coins of Kashmír caused other numismatists to search and the result was a great find of coins of both the Sultáns and Máhárájahs. I too was aroused from my lethargy and led to see if I could not get a few more coins, and I dared to hope that as I had published the copper coins of ten Sultáns, I might perhaps secure the silver coins of the same number of kings. I tried all the bazaars of the Panjáb, but they gave me nothing. A friend of mine travelling from the Jhelum to Kángra along the outskirts of Jammú tried every village bazaar, and he was successful in getting several coins amongst which was one of Mahmúd Sháh a name hitherto unknown in the annals of Kashmír, and of whom I have not as yet seen a copper coin. But more than this he obtained the *silver* coins of no less than five of the old Máhárájahs in fine condition. These are round and are similar to the copper coins only of much finer workmanship. This success led me to try for myself in Jammú and its environs.

I accordingly secured the services of an intelligent native who could read Persian well and draw a little, and who was moreover honest and so active as to seem almost ubiquitous. He made two or three journeys on my behalf and the result was that on starting from Amritsar on a year's furlough I had the pleasure of taking with me coins with the names on them of no less than seventeen Sultáns. One of them, however, had come to me in exchange from my revered friend General Cunningham,—that of Fath Sháh. During my absence Dr. Stulpnagel employed the same young man with equally good results for he obtained an additional coin, that of Yaqúb Sháh's. I afterwards secured a second one for General Cunningham. The accompanying three plates represent the coins thus obtained.

I do not think I can do better than transcribe the inscriptions so far as I can decipher them. Perhaps more successful numismatists or happier possessors of better specimens will be able to put me right on several points. I need not say how happy I shall be to be corrected as what I am in search of is historical correctness. We must not be shocked at the revelations of the coins. Here they are, the metal records, struck, as we have every right to believe, by the Sultáns themselves during the time of their reign. We must take them exactly as they are—

Margin.	Reverse in scalloped lozenge.	Obverse.	No.
في شهور سده اثني لعه	ضرب كشمير	السلطان الاعظم سكندر شاه	1
في شهور سده اثنين و اربعين و ثمانمابة	do.	السلطان الاعظم زين العابدين ٨٤٢	2
do. do. do.	do.	السلطان الاعظم حسن شاه ٨٧٦	3
Variant of No. 3.	do.	do. do. do.	4
Illegible.	do.	السلطان الاعظم محمد شاه	5
في شهور سنة احدي ؟ ؟	do.	do. do. do.	6
في شهور سده اثنين و اربعين وثمنماية	do.	السلطان لاعظم فتح شاه	7
Smudged copy of above.	do.	السلطان الاعظم نادر شاه	8
Muddled copy of margin of No. 7.	do.	do. do. do.	9
في شهور سنة سبع و خمسين و تسع ماية	do.	do. do. do.	10

Margin.	Reverse in scalloped lozenge.	Obverse.	No.
The reverses of these two coins are so bad I have not drawn them.	ضرب كشمير	السلطان الاعظم شمس الدين	11
		do. do. do.	12
في شهور سنه ثلث وخمسين و تسع مايه	ضرب كشمير	السلطان الاعظم محمد همايون عازی	13
do do. do.	do.	do. do.	14
في شهور سنه سبع وخمسين و تسع مايه	do.	السلطان الاعظم اسلام شاه ٥٧	15
Illegible.	do.	السلطان الاعظم ابراهيم شاه	16
Copy of margin of Nos. 2 or 7	do.	السلطان الاعظم اسماعيل شاه	17
في سنه تسعمايه و ستين و احدى	do.	السلطان الاعظم محمود شاه ٩٦١	18
Illegible.	do.	نصر الدين محمد عازی شاه (؟) ٩٦	19
في شهور سنه سبعين و تسعمايه	ضرب كشمير	نصير الدين محمد حسين بادشاه عازی	20
do. do. do	do.	do. do.	21
٩٧٢ فی شهور سنه اثنين و سبعين و تسعمايه	do.	do. do	22
٩٨٩ (?) بتاريخ سنه نهصد و هشتاد (و نه) ؟	ضرب كشمير	ظهير الدين محمد علي بادشاه ٩٨٩ (؟)	23
٩٨٠ بتاريخ سنه نهصد و هشتاد	do.	do. do.	24
٩٨٧ في سنه نهصد وهشتاد و هفت	do.	do. do.	25
do. do. do.	do.	نصير الدين محمد يوسف بادشاه عاري	26
do. do. do.	do.	جلال الدين محمد اكبر بادشاه عازی	27
في سنه تسعمايه و ستين واحدى	do.	اعظم محمد جلال الدين اكبر	28

Margin.	Reverse in scalloped lozenge.	Obverse.	No.
Unintelligible and not given.	ضرب كسمير	اعظم محمد جلال الدين اكبر بادشاه	29
Not given but date same as on 28.	do.	السلطان الاعظم جلال الدين محمد اكبر	30
في شهور	do.	السلطان الاعظم حيدّر شاه ٨٧٤	31
في شهور سنه اثني و اربعين و ثمانمائه	do.	السلطان الاعظم محمد شاه ٨٤٢	32
في شهور سنه خمسين	ضرب كشمير	السلطان الاعظم ح محمد همايون غازي	33
٩٨٧ بتاريخ هفت هشتاد و نه صد	do.	نصير الدين محمد يوسف بادشاه غازي	34
٩٩٢ بتاريخ دونو دو نه صد	do.	نصير الدين محمد يعقوب بادشاه غازي	35
في شهور سنه اثني اربعين و ثمانمايه	do.	السلطان الاعظم بد يا علي ٩١٤ (?)	36
Same as 35.	same as 35.	same as 35.	37
٩٨٧ بتاريخ هفت هشتاد و نه صد	do.	ع الدين محمد غازي	38
بتاريخ نه صد نود ٦ (?)		السلطان الاعظم محمد اكبر	39
٤٧ الهي اسفندارمز		ضرب سري نگر	40
اكبر الله جل جلاله		ضرب سري نگر ٤٧ الهي خورداد	41
do. do.		ضرب سري نگر ٥٠ الهي اردي بهشت	42

Coins Nos. 39 and 40 are copper. They are given to illustrate remarks made in the course of this essay on the *silver* coins of the Sultáns. They are both of them new to numismatists not having yet been published. No. 40 is exceedingly rare. I have only seen one other like it.

There are several points calling for notice in the above list of coins (1) On some coins the dates are given in two ways in figures and in words. Some have only the words (2) In some cases the date is in Arabic words in others in Persian. (3) The same date,—*viz.*, 842 appears in Arabic words on the margins of coins which either possess another date in figures or are the coins of kings who reigned long after 842. One coin of Muhammad Sháh No. 32, Pl. III has the date 842 in figures as well as words. (4) The date on coin No. I, Pl. I, is certainly like the date on the coins of Zain ul Ábidín. And yet No. I is a coin of Sikandar the father of this king. It is just possible that Zain ul Ábidín struck the coin in honour of his father. All the silver coins I have yet seen of Zain ul Ábidín have one date 842 in both figures and words, the figures appearing on the obverse and the words in the corners of the reverse. Hasan Sháh's coins have on them 876 in figures on the obverse and yet 842 in Arabic words on the reverse. Fath Sháh and Nádir Sháh in his earlier years used the same date 842 as far as I can judge. (5) The reverse of a coin of Akbar, No. 28, Pl. II seems to have been struck with the very die that was used for Mahmúd's coin No 18, Pl. II, the year having the same 961 two years before Akbar came to the throne. All this is very strange. It reduces the value of the coins as aids in historical research to a minimum. What we want in the history of Kashmír is an accurate and trustworthy chronology and yet the coins which we usually regard as worthy of trust prove in this case to be worthless or nearly so. All the manuscript histories I have as yet consulted give different dates. They all vary from Prinsep. And Prinsep and all the MSS. differ from the coins The later coins, however, seem trustworthy. I think we may accept the date in figures on Hasan Sháh's coin, 876. The date on both the silver and copper coins of Haidar Sháh is in figures 874. This date was evidently a favourite one for I have a small copper coin of Muhammad Sháh and also of Fath Sháh with this date on in *figures*. There are parallel cases to this. In my paper on the Sikh coins I showed that Ranjít Singh adhered to the year 1884 A. S. for ten years and to 1885 A. S the Sikhs adhered until they ceased coining. But in small figures on the other side the real year was inserted.[*] Again the H. E. I. Company struck coins at Farrukhábád on which the year is invariable 45th of Sháh Álam; at Murshedábád 19th year. Surat and Calcutta mints each had an invariable year. Fortunately we have no need of numismatic aid for the period of the Company's rule.

It will be seen that no coins of the early Sultáns have as yet been found. If my reading of the date of coin No. 1, pl. I, bearing Sikandar's name be correct then the first silver coins are those of Zain ul Ábidín. We have, however, Sikandar's coins in copper. In my own small cabinet I have five undoubtedly his and several doubtful ones. Every cabinet of coins in the Panjáb contains a lot of coins of Kashmír in copper which no one has yet been able to assign to any known ruler.

It is very peculiar that no coins bearing the name of Habíb Sháh have yet been found. It is probable, however, that although Habíb's name occurs in inscriptions the name of the coins was Mahmúd.

Again we have on the coins the name of *Nádir* Sháh. Now, no list of kings gives this name. They all have *Názuk Sháh.* This must have arisen from some mistake of the early copyists unless indeed his name was Nádir Sháh on his coins and Názuk Sháh in the mouths of the people. In one MS. in the British Museum the name Názuk Sháh is spelt variously تار شاه بار شاه مار شاه and نار شاه. All the MSS. read Názuk and all the coins both in silver and copper read Nádir. No coin has yet been found with Názuk on it.

There were two kings of the name of Shams ud Dín. I think the coins are those of the second and not of the first king of that name. Unfortunately neither of the coins I figure has a margin worth drawing. It is perfectly illegible. Hence no date can be made out.

Of Islám Sháh and Humáyún I shall speak in another place.

It seems to me that these coins evidence that Arabic was not much studied in Kashmír, or if studied, the knowledge of it was confined to the Muhammadan saints and sages with accounts of whose accomplishments and virtues Muhammad A'zim's book abounds. The knowledge did not get into the mint. The reign of Zain ul A'bidín was, however, favourable to learning In the confusion which followed learning was but lightly esteemed.

The coins vary very little There is a certain monotony about them. They are all square They have the same kind of lozenge on the reverse The differences in the inscriptions will be at once visible. There are two the names on which I cannot make out. Nos. 36 and 38. Pl. III. Perhaps some one has better specimens. No. 30 is the property of my learned friend Dr. Stulpnagel as is also No. 35. I have much pleasure in acknowledging the kindness which placed the coins at my service. The same pleasant duty I have to perform to General Cunningham for the use of No. 37 All the rest of the coins are or were in my cabinet. Many have found rest in the British Museum.

When Akbar had got a fair hold on the country then he struck rupees in Kashmír with his own peculiar inscription on them. Nos. 41 and 42, Pl. III are two rupees of this kind struck in Srínagar. No. 40 is a copper dám struck in the same city. No. 39 is a copper coin of Akbar following the style of the old Sultáns.

The weight of the square silver coins varies from 91 to 96 grains. The lightest is one of Shams ud Dín's the heaviest one of Yúsuf Sháh's. Zain ul A'bidín's coins vary as much as 3 grains. Some are worn more than others. If the coins of Shams ud Dín are of the 1st king then we can understand their being so much worn. But we cannot understand why his immediate successors' coins have not been found yet.

The five silver coins of the Maharajah's which I have vary from 82 to 87·9 grains. This weight is about 10 grains less than the average weight of the Muhammadan coins. Hence we cannot say that these square coins are the successor of the Hindu coins which were called *padákas.* The difference between the copper coins of the Máhárájahs and their silver coins is this; on the reverse instead of the word *deva,* the name of the coin पदक is given. The word used in Farishta, when speaking of these coins is *Sikka* سکه.*

Perhaps it will make matters easier if now without further preamble we give a slight sketch of the History of Kashmír under its own Sultáns, and thus show who the people were whose coins we have here drawn. Throughout I shall be guided by Farishta whose authority seems trustworthy and who seems to have consulted trustworthy authorities.

Sháh Mír.—In the reign of Sinha Deva in the year 715 A. H. = 1315 A. D., one year after the battle of Bannockburn, a faqir by name Sháh Mírzá or Sháh Mír appeared in Kashmír. He gave himself out to be a descendant of Arjun one of the Pándús. So he was of Hindu descent though of the Muhammadan religion. He became a servant of Sinha Deva who, however, died shortly afterwards. Sinha Deva was succeeded by Rinchina Deva who made Sháh Mírzá his wazír and the tutor of his son Chandar. Rinchina Deva died in 1318 A. D. and he was succeeded by a relative of his named Udyána Deva who came from Kandahár. This MaháRájah made Sháh Mírzá his wakíl and his two sons Jamshed and Alí Sher received appointments. Sháh Mírzá had two other sons Sarashának and Hindál. These also obtained power and office Too late Udyána Deva found out his mistake. The father and four sons grew daily in wealth and power. The Mahárájah was a mere cypher in the land. At last in 747 A. D. he died. His widow Kotáh Rání desired Sháh Mírzá to put Chandar his pupil and the son of Rinchina Deva on the throne, and himself to hold the reins of government as before. He did not obey. She raised an army and went against him and was defeated and taken prisoner. She at length consented to marry Sháh Mírzá and to become a Muhammadan. One day and one night she spent as his wife. The next day she was seized and sent to prison. And then Sháh Mírzá, *causing coins to be struck,* and the khutba to be read, *in his own name* ascended the throne with the title of Shams ud Dín. (There is just a possibility that coins Nos. 11 and 12 are of this Sultán. The points in favour of this view are (1) the archaic fo[illegible] of the letters, (2) light weight evidently caused by wear, and (3) the fact that Shams ud Dín I was a ruler of some importance; whereas Shams ud Dín II was a puppet king.)

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* General Cunningham says in a letter received from him, 11th May 1884, "I have ascertained by actual assay that the so-called silver Hindu coins of Kashmír do not contain even the faintest trace of silver. They are simple white brass made of zinc and copper."

He reigned in all three years and died in his eightieth year. His reign would seem to have been a beneficial one. He raised two families to eminence the Chakks and the Mákarís. From these two families the chief generals and leaders and soldiers were drawn. He left the throne to his two sons Jamshed and Alí Sher. This was about 750 A. H. as Shams ud Dín obtained the throne about 747 A. H. and reigned three years.

(The above is one account. A manuscript history says that Zuljú in 724 A. H. came to Kashmír with an army of Turks and Moguls when Rinchina was king. This Zuljú is represented as marrying Rinchina's widow. The MS. goes on to say that Shamsher got the throne in 742 A. H. and Ala-ud-Dín in 748, A. H. We must not expect exactness in either names or dates from native historians. Indeed all throughout we may lay this down as an axiom that ignorant copyists can never be trusted to make accurate copies of books they do not understand. Another MS. which I consulted on a former occasion has it that Ratangirí was the first Sultán of Kashmír and that he was a second Solomon. Zuljú is said to have come from Kandahár and to have returned there.)

Alá-ud-Dín.—After the death of Shams-ud-Dín, the brothers fought for the throne for about fourteen months. Eventually Sháh Jamshed was defeated and Alí Sher came to the throne under the title of *Alá-ud-Dín* and he made his younger brother Sheráshának his waqíl. In the early years of his reign there was plenty in the land, but the latter part of it was troubled with famine. One good law he made:—that no bad woman should have any inheritance from her husband. This law acted well. It restrained the women. This lets in a little light on the social condition of that time and land. Alá-ud-Dín reigned twelve years eight months and thirteen days.

Shaháb-ud-Dín.—His younger brother ascended the throne under the name of Shaháb-ud-Dín. He was a great conqueror. The day that passed without the receipt of a report of some victory or other obtained by his troops he did not count as a day of his life. Kandahár and Gazní feared him. He himself went to Pesháwar and threaded the passes of the Hindú Kush. He planted his tents on the banks of the Satlaj and in the way the Rájah of Nagarkot (Kángrah) gave in his submission. This rájah was just returning from a plundering expedition in the direction of Dehli and part of the plunder was given as a present to Shaháb-ud-Dín. Little Tibet also sent a message desiring peace.

On his return to his capital he made his younger brother Hindál his heir to the exclusion of his sons Hasan Khán and Alí Khán whom he sent away in the direction of Dehlí. He reigned, in all, 20 years. In his reign Musalmans were few in the land, but as this king built a city which he called by his own name, he created in it a mosque, probably the first built in the valley.

Kutub-ud-Dín.—Hindál succeeded him under the title of Kutub-ud-Dín. His reign was disturbed by troubles at the bottom of which was his nephew Hasan Khán. He is said to have reigned fifteen years five months and to have died in 795 A. H.

Working back from this date with the data which our historian

	A. H.
has supplied us with, we shall find that Kutub-ud-Dín ascended the throne in	781
Shaháb-ud-Dín	761
Alá-ud-Dín	748
Jamshed	746
Shams-ud-Dín	743

We have seen before that it was in 747 Shams-ud Dín came to the throne.

The "Náma-i-Sháhán-i-Kashmír" gives 796 A. H. as the year of Kutub-ud-Dín's death and the Tawarikh-i-Kashmír" gives 795. Lithographed editions of Farishtah give 796 A. H. Prinsep's Tables give 799 A. H. General Cunningham makes it in 1386 A. D. = 788 A. H. The five authorities bring it within a compass of eight years, so that no one of them is very much out. The Muhammadan historian concludes his account of the above reign with an Arabic question و الله اعلم بالصواب and God knows what is right. This is his way of getting out of the difficulty. With our present knowledge it must be ours too.

Sikandar.—It was somewhere about the end of the reign of Richard II, that Sikandar the son of Kutub-ud-Dín ascended the throne of Kashmír. He was young having been born in his father's later years. His mother Súrah looked after his interests. She drove away Sikandar's father-in-law. Rái Mádarí, a noble of the court poisoned Sikandar's younger brother Haibat Khán and thus relieved him of this source of anxiety. But the poisoner fearing the king obtained permission to conquer Little Tibet. This he accomplished and then revolted. Sikandar in person moved against him and Rái Mádarí was defeated and being taken prisoner he poisoned himself. Sikandar then looked after Tibet on his own account.

It was at this time that Taimúr made his descent upon India.

Sikandar at once sent in his submission and gave Taimúr's ambassadors much gold and many presents. Sikandar was ordered to present himself with proper presents on Taimúr's return from Dehli. He got ready all he could. But he was told by sone of Taimúr's servants that he must give at least 3,000 horses 1,00,000 ashrafís. These vast numbers of to him valuable things were unobtainable. He therefore excused himself to Taimúr by saying that he had nothing worthy of being offered to so great a sovereign, but that he would return to his home and prepare a right royal present for him. Taimúr guessed that his nobles had been trying to squeeze all they could out of Sikandar and accepted the excuse. Sikandar got all ready, but when he got out of Kashmír with his gifts, by the pass of Báráműla be found Taimúr had crossed the Indus and was on his way to Samarqand. Thither he sent ambassadars with his offerings and he himself returned to Kashmír.

Sikandar was an exceedingly generous man. Hearing of this, learned men from Iráq and Khorasán and Mávará-un-Nahr flocked to his court in such numbers that it became an example to the courts of those provinces. Sayyid Muhammad, one of the learned men, instructed the king in all the rites of the Muhammadan religion. But Syah But a Brahman convert to Islám was made prime minister and to him were consigned all the affairs of the state. This minister signalized his term of office by a zeal in the persecution of his former co-religionists such as has seldom been seen in the history of religious turn-coats. The king (of course acting on the advice of his prime minister) ordered all Hindús to become Musalmáns or leave the country. He forbad the use of the tíká on the forehead and commanded that women should not be burned along with their husbands. All idols of silver and gold were ordered to be melted down. Many of the Brahmans rather than obey these orders committed suicide. Other preferred exile. Some few became Musalmáns. The Sultán used every exertion to destroy idols. One famous Máhá Deo and one Chakk Deo were destroyed by his orders, When these idols were broken flames issued from the fracture. These flames were supposed by the Hindus to be miraculous, but the Sultán rightly judged they were caused by the superior science of the Brahmans, and stayed not his hand until all were destroyed. Under one of these temples it was said a copper plate was found with an inscription on it to the effect that the temple had been built by Lilitáwat Rája who had consulted the astrologers as to whether it would remain and how long. The answer was that it should stand 1,001 years and then be destroyed by a person of the name of Sikandar. The Rájá ordered this to be recorded on a copper plate and that this plate should be put in a copper box for safety under the temple. The Sultán is said to have remarked on hearing the inscription read to him, that had the plate been on the wall he would not have destroyed the temple and thus would have upset the pretensions of the astrologers.

Sikandar by such acts as these earned for himself amongst Musalmáns the title of *Butshikan* or Iconoclast. Like the bigot he was, he forbad all use of wine in his dominions. He at last died of a burning fever in the year 819 A. H after a reign of 20 years and 9 months. His death took place one year after the battle of Agincourt. Hence his persecution of the Brahmans was contemporaneous with the persecutions of the Lollards in England, and the result was much the same in both countries. Kashmír is now one of the head quarters of Brahmanism and lessons of intolerance learned 500 years ago seem not to have been forgotten.

Alí Sher.—Sikandar left three sons Mír Khán, to whom he gave the kingdom and the title Alí Sher, Sháhí Khán and Muhammad K͟hán.

When Alí Sher ascended the throne the converted Brahman Syah But was kept on as wazír. His treatment of his former co-religionists became more and more severe. The Brahmans fled the country until not so much as the sign of one remained. Syah But's persecutions soon came to an end for he was carried off by consumption After his death Alí Sher determined to see the world. He made his brother Sháhí K͟han, a young man of great ability, his viceroy during his absence. Going by the way of Jammu Alí Sher was persuaded to return to Kashmír to wrest the reins of government from Sháhí K͟hán. He was successful and Sháhí K͟hán became a fugitive in the direction of Síálkot where he met with a Ghakkar named Jasrat who had escaped from the hands of Taimúr in Samarqand and had attained to something like kingship in the Panjáb. Alí Sher followed him. But Sháhí K͟hán and Jasrat defeated him in a night attack and here he is lost to history. He had reigned six years and nine months when this event happened in 826 A. H. Some authorities say he went on a pilgrimage.

Zain-ul-Ábidín.—Sháhí K͟hán ascended the throne with the title of Zain-ul-'Abidín. The events of the long reign of this the greatest of the Sultáns of Kashmír are given without any reference to their chronological sequence. There is evidently a strong desire on the part of the historian to exaggerate. It is easy to tolerate this. We must make allowances. There is no doubt that the actions of the Sultán were worthy of being chronicled: they speak for themselves. For half a century and more Kashmír was blessed with the rule of this virtuous and tolerant prince

His first recorded acts were those of conquest, the Panjab and Tibet, with the aid of Jasrat, coming under his rule. Making his younger brother Muhammad Khán his wazír he gave himself to the administration of justice. He filled his court with the wise of the Musalmáns and Hindus. He himself knew music well. He spent his time in superintending the agricultural improvements of the country and in increasing the means of irrigation. He published a common order that if any theft occurred the headman of the village or town where the theft occurred should be held responsible. Thus theft was banished the country and the bad actions of Syah But were rendered harmless. He abolished also the food rates which Syah But had established. He wrote all his commands on copper tablets and sent them to every town and village. Srí Bihut was made physician and on his application the Brahmans whom Syah But's persecution had driven out of the country were re-called and had lands given to them. The poll tax on Hindus was abolished and the worship of idols was tolerated. The killing of cows was done away with. He made a covenant with the Hindus that he would rule them justly and according to their own law. Everything that Sikandar had abolished he restored, such as the *thiká* on the forehead and even *satí*. He forbad the acceptance of gifts by tahsíldárs. He forbad merchants to hide merchandize in their own houses, and compelled them to expose it for sale at a reasonable profit. He released all the prisoners of former kings. Whatever countries he conquered he divided the treasure obtained amongst his troops. He punished the rebellious and raised up those of low degree. He fed the poor in a moderate fashion, so that they might not "wax fat and kick." He himself kept to one woman,—his wife, and looked on none other with a desire to possess himself of her. He increased the length of the yard and chain. For his own private use he expended the proceeds of his copper mines only. As Sikandar had melted down gold and silver idols, for purposes of coinage, the king gave order that coin should be made of copper from his copper mines. (No *gold* coins of Sikandar have been found. But Zain-ul-'Abidín coined extensively in silver and brass. General Cunningham has I believe gold coins of Harsha Rájah, and the Lahore museum has a gold coin of Yúsaf Sultán.)

Every man was allowed to follow his own religion. No one could act with intolerance to another. All the Brahmans who had forcibly become Musalmáns in Sikandar's time returned to their old religion. The king brought a canal from the mountains and built a city five koss in circumference. He also made other canals and bridges. The cities he built he peopled with learned men and also with the homeless in order that travellers might be fed and the needy relieved. The whole of Kashmír became well-irrigated. In Ver Nág he made a large building which he called Lánká. This Ver Nág is a large pond, and the erection of a heavy building in it was accomplished much in the same way as the masonry in wells is supported on wooden foundations. The name given to this building was Lanká, but the purpose was Muhammadan. The building was a mosque. But Muhammadan poets and Hindu jogís were received by the king. His wise men solved all kinds of difficult questions at once.

One day a woman in the city got angry with her maid-servant. She wished even to kill her, but she could not accomplish it. So she killed her own child and went unto the king in the morning and said the maid had done it. The matter was laid before the wise men who could make nothing out of it at first. But afterwards they called the maid and asked whether she had done the deed or not. She protested her innocence and was told to show her confidence in her own cause by appearing naked before the assembly. This she refused to do saying she was not going to add to the evil of being accused the additional one of exposure and shame. She was then dismissed and her accuser was called. She was asked whether her accusation were true. She replied, "If it be not, kill me." The assembly replied, "No, but if you are guiltless, strip yourself naked before us." She was proceeding to do this when the king stopped her with, "The crime is yours." The guiltless maid was set free and the guilty woman punished.

The king did not execute persons for theft (he was three hundred years ahead of England) he put them in fetters and made them work at making bricks, &c. He also forbad hunting. During Ramzán he never ate flesh. When his liberality was known, musicians of note flocked to his court. Kashmír became another country with their presence. One scholar of Abdul Qádir of Khorásán was an excellent performer on the lute. Another Mullá Jamíl was both poet and singer. His name is a proverb in Kashmír for excellence in poetry. Jab, a celebrated maker of fireworks was also patronized by the Sultán. He made gunpowder in Kashmír and was well up in other sciences. Dancers too found a patron in Zain-ul-'Abidín. Acrobats made Kashmír their home. None went away unrewarded. Dasúm a Kashmírí poet wrote an account of the events of the Sultán's reign in a book called "*Zain Harab.*" Búdí But, a man who had committed to memory the whole of the Sháh Náma (a prodigious task) wrote a book on music which he repeated before the Sultán. Zain ul 'Abidín himself knew Persian, Hindí and Tibetan. According to his commands books were translated out of Arabic into Hindí, and Hindí books into Persian, &c. He ordered the Mahábhárata to be translated. By his orders *the* history of Kashmír, the Rajáh Taringiní was compiled. He also caused the history of Kashmír to be written in Persian.

Neghbouring rulers hearing of his fame became desirous of his friendship. Abú Said sent him a present of horses, mules and camels. The Sultán in return sent him some maunds of saffron, pepper, musk, itr, (otto-of-roses) vinegar, shawls, cups and goblets of crystal, and other rarities of Kashmír. The Rája of Tibet sent him two rare swans from the lake of Mansarowar. These pleased the king very much. (The historian adds that when milk and water were mixed together and placed before them, they separated the milk from the water with their bill, and drank the former and left the latter in the vessel.)

At the commencement of his reign he had appointed his younger brother prime minister and his heir. On his death *his* son Haidar was appointed to the offices held previously by his father. Zain-ul-Ábidín had three sons, 'Adam Khán with whom the Sultán was always angry; Hájí Khán who was the beloved of his father, and Bahrám Khán his youngest son to whom many jágírs had been given.

Zain-ul-Ábidín must have been very rich for it is recorded of him that he gave a kror pieces of gold, (we are not told whether they were coins or not) 400 camel loads, for the repose of the soul of a man whom he had executed because he had been guilty of the death of his brother. (It is very strange that no gold coin of this Sultán has been found. Probably the historian means rupees. The words zar زر and tila طلا are however used in the text.)

In these days the Sultán fell sick. What the sickness was we are not told. But we are told how he was cured. A jogí came and said he could cure the king. He and his disciple gained admission to the king's chamber and after some time the jogí was taken away weak and faint. He said he had given the king his own spirit and had taken the king's spirit into his own body. The author is puzzled to account for the king's getting better. He supposes the jogí to have been a second Elijah and to have prayed over the king who at any rate recovered. The jogí was suitably rewarded.

It is more than we have a right to expect that Ádam Khán should be always content with his father's preference of Hájí Khán his next younger brother. Ádam returning from a successful expedition against Tibet (Tibet was the Algiers or Tunis of Kashmír in those days) brought with him much plunder and of course pleased his father. Hájí Khán was ordered to Lauharkot and Ádam was ordered to stay with the Sultán. Hájí went but without permission returned. He evidently thought Ádam was trying to work himself into the good graces of his father. The Sultán ordered Hájí back but he refused to go, and a battle was fought at Pulpul in which the elder brother and the Sultán were victorious. Hájí escaped to Bhimber. The king made a pyramid of the heads of his opponents. The result of this rebellion was that Ádam Khán was made heir to the Sultán and after this there were six years of peace.

A famine is recorded about this time. The Sultán distributed amongst the people the contents of the granaries and although the famine was very severe it was met. It may have been owing to the famine (we do not know) that the king reduced the taxation to a fourth part of the produce in some places and to a seventh part in others.

Ádam Khán seems to have been a really bad man. In his government of Kamráj* he was so oppressive that the people complained to the Sultán. Ádam rebelled. He was, however, quieted by some strange action of his father. But Zain-ul-Ábidín knew his two sons. He recalled Hájí Khán and with his aid he drove Ádam out of the valley. On returning home the Sultán presented his own sword to Hájí and made him his heir. When freed from his brother and at peace in Kashmír Hájí took to drinking and caused the Sultán much anxiety. At this juncture the king was seized with dysentery. Hájí being constantly intoxicated, the affairs of the kingdom became confused. The nobles therefore secretly recalled Ádam Khán and he came and saw the king, before whom he stated the condition of affairs and asked him to appoint his successor. This the king neglected to do. Bahrám, the youngest brother, made the most of this opportunity and sowed the seeds of dissension between Ádam and Hájí. The result was that Ádam retired to Kutub-ud-Dínpúr. The Sultán became worse daily. The nobles fearing the jealousies of the brothers would break out in disturbances, would not allow them to see him. Occasionally they placed the king on the throne and ordered the drum to be beaten as though nothing was amiss. Hájí and Bahrám went out daily armed against Ádam. The Sultán hearing of this became worse and lost the use of his limbs and became delirious. One night Ádam went into the city alone to see his father. On that night the nobles assembled to elect Hájí as successor to the throne. Ádam was expelled the city and Hájí obtaining possession of the king's stables and treasury was acknowledged Sultán. Ádam went by the Bárámúlla pass to India. At this time Hasan Khán joined his father Hájí Khán from Poonch. This help was very opportune.

Zain-ul-Ábidín reigned in all 52 years. He died aged 69 in the year 877 A. H. His reign was long and to a certain extent prosperous. But its close is not a pleasant sight to contemplate. There was evidently no fixed and settled law in the land. Everything depended on the king. The nobles, as we have seen, now and then exercised certain functions. But their position and their privileges were undefined. There were elements of stability and lawfulness in the land, but they wanted to be worked up. There was no idea of freedom and without this, these very elements of stability became each a nucleus of selfishness and intrigue. The results were soon seen in the anarchy which ensued under the rule of nominal kings who were placed on the throne as a mark for the machinations of the different parties who were seeking pre-eminence for purposes of self-aggrandisement and plunder.

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* The valley of the Pohrí is called Kámráj. Pohrí joins the Jhélum on the right bank just below Sopúr. Kámráj is therefore the N. W. valley of Kashmír.

(Of three historians whom I have consulted one gives the death of Zain-ul-A'bidín in 884 A. H. and another in 878, and the third in 877 A. H. Now the coins of Haidar the successor of Zain-ul-A'bidín have on them 874 A. H., and he reigned as we shall see only one year and two months. Hence if the coins are right, all the historians are wrong. I incline to think the coins are correct.)

Haidar Sháh.—Hájí K͟hán taking the title of Haidar Sháh was crowned king, his brother Bahrám and his son Hasan placing the crown upon his head. The province of Kamráj was given to Hasan in jágír with the title of Amír-ul-Umrá and heir-apparent. Bahrám received as his jágír the province of Nágám.* Haidar satisfied only a portion of the nobles who came to his coronation. Many returned dissatisfied. As the Sultán was unacquainted with the country, these nobles oppressed their people as much as they liked. Haidar made his barber Lúlú his confidante and favourite. This low fellow at once showed his nature by taking bribes from all quarters, and by leading the Sultán into all kinds of evil. Hasan K͟hán Kachhí a worthy noble, was executed by Lúlú. At this time A'dam K͟hán, having gathered together an army arrived in Jammú, but when he heard of the fate of Hasan Kachhí he advanced no further. He stayed in Jammú and made himself useful in resisting the Moguls who were then troubling the country. In a skirmish he was hit in the face with an arrow and killed. Haidar, hearing of his death, had his corpse removed to Kashmír and caused it to be buried near the tomb of his father. Meanwhile the king's inebriety became confirmed and at last he became ill. The nobles secretly desired to make Bahrám king. The son of A'dam K͟hán, Fath K͟hán, hearing of this in Sirhind where he was engaged in reducing forts and towns by order of Haidar, returned suddenly to Kashmír with much plunder. But his coming was not acceptable to the king. Things came rapidly to a crisis however. For Haidar one day getting intoxicated fell from the roof of his house and was killed after a reign of 14 months.†

Hasan Sháh.—By the exertions of Ahmad Aswad (the Black)

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* Nágám, South of Srínagar in the lower hills.

† For Coin of Haidar, see No. 31, Pl. III.

Hasan the son of Haidar was proclaimed king. His opponents were imprisoned. The treasuries of the Sultán were opened and much money was distributed. Ahmad was made prime minister and his son Nauroz was made kotwál of the city. Bahrám Kh̲án seeing the kingship had slipped out of his hands fled in the direction of India. Hasan began by renewing the edicts of Zain-ul-'Abidín which in the reign of Haidar had fallen into disuse. For this reason several discontented nobles fled to Bahrám Kh̲án and got him ready for an invasion of Kashmír. Others wrote letters to him and invited him to the country. Bahrám returned by the way of the mountains to Kamráj At last a battle was fought in which Bahrám and his son were captured. They were both thrown into prison. After awhile Bahrám was deprived of his eyesight by a needle being drawn through the eyes میل در چشم کشید and he died after a short interval from the agonies endured in this fearful operation.

It seems that an enemy of Ahmad's by name Zain Badr a wazír of Zain-ul-'Abidín's was one of the principals in this dreadful business. Hasan Sháh had him at once apprehended and with the very needle that Bahrám had had his eyesight destroyed, he himself was rendered blind. He remained in prison for three years after this and then died. Ahmad Aswad thus became strong. He sent Malik Bárí Bihut to assist the Rájah of Jammú, against Tátár Kh̲án, who had been sent by the emperor of Dehlí to govern the Panjáb, and who was harassing the borders of Kashmír. They plundered some parts of the Panjáb and destroyed the town of Siálkot.

Hasan had two sons by Haiyát Kh̲átún daughter of Syud Hasan, one was named Muhammad who was confided to the care of Malik Bárí Bihut; the other Husain was given into the hands of Malik Nauroz the son of Ahmad Aswad to be educated. The usual thing happened. Ahmad Aswad and Bárí Bihut got at loggerheads with each other. They each tried to oust the other. The nobles took up the quarrel. At last things grew to such a pitch that they fought in the very presence of the king. Malik Ahmad Aswad fared the worse of the two. He was sent to prison with numbers of his followers and all his goods were confiscated and he himself died in prison. Sultán Hasan then recalled to Kashmír an exile named Syad Násir who had been near Zain-ul-'Abidín, but the Syad died when near the Pír Panjál pass. For this reason the Sultán sent to Dehlí for his wife's grandfather Syad Hasan. ‘The new comer soon turned the nobles against the Sultán and besides this executed great numbers of them. He also imprisoned Malik Bárí. The rest of the nobles seeing this fled. Jahángír Mákarí in his flight found refuge in Lauharkot. At last Hasan Sháh from over uxoriousness از کثرت جماع drew nigh unto death. In his last moments he consigned his children into hands he thought worthy of the charge. He appointed Yúsuf K͟hán, the son of Bahrám K͟hán, who was in prison and Fath K͟hán son of Ádam K͟hán who was in Jasroth their guardians and Muhammad K͟hán his successor. Sayyid Hasan outwardly concurred. The Sultán shortly after died. The historian adds "the duration of his reign is not known." One MS. I have consulted says he died in 897 A. H. Prinsep puts in it 891 A. H. His silver coins are dated 876 A. H. on the obverse in figures. According to Farishtah this is one year before the death of Zain-ul-'Abidín. The histories I am inclined regard as mistaken. The reverses of the coins adhere to the 842 in words of Zain-ul-'Abidín's coins. Hence it was all the more necessary to put the real date of the king somewhere on the coin. They therefore placed it *in figures on the obverse along with the name.* See figs. 3 and 4, Pl. I.

Muhammad Sháh, 1st time.—Muhammad Sháh was but 7 years of age when his father died. Sayyid Hasan was the chief agent in securing the throne for his grandson. Regencies have always been prolific in disturbances even in countries where there is a settled law. We shall not be surprised therefore to find that, in Kashmír, where there was no law of succession, the disturbances were many and frequent.

When the treasury was opened to the young king, and the wealth of the state and its resources were exhibited to him, he is said to have laid hold of a bow rather than on the gold and silver. From this the Kashmírís augured that he would prove a brave and warlike ruler.

But the Sayyids were at that time all-powerful in council. No one could approach the king. At that time the Rájah of Jammú was a refugee in Kashmír, from the tyranny of Tátár K͟hán Lodí the governor of the Panjáb. The Kashmírís getting the Rájah to help them murdered Sayyid Hasan, and thirty of his slaves, and then crossing the Jhelum destroyed the bridge. Meanwile Sayyid Muhammad, uncle of the king, took care of him. Another Sayyid murdered the son of Bahrám K͟hán in prison because a section of the community desired to raise him to the throne. The upshot of things was that the Sayyids and the popular party came to blows. The city became a prey to both parties. Jahángír Mákarí of Lauharkot was invited to assist against the Sayyids. His son Dáúd K͟hán Mákarí was sent. But in an engagement with the Sayyids he was slain, together with numbers of his friends. Pyramids were made of the heads of the slain. The next day the battle was renewed on the bridge, which, breaking in the middle of the battle caused great loss on both sides. At this juncture the Sayyids asked Tátár K͟hán Lodí to assist them. He sent a large army, but when it arrived at Bhimber it was destroyed. The cause of the Sayyids became desperate. The popular party began to look up and take heart. The city was plundered by the latter and destroyed by fire. In this fire 10,000 men are said to have lost their lives. This occurred in 892 A. H. The Sayyids were entirely defeated and expelled the country. The popular party got the king into their power and on their side. Paras Rám, the Rájah of Jammú was rewarded and dismissed.

The popular leaders being thus left to themselves, each one began to seek place and power for himself. In the midst of this confusion Fath Khan, grandson of Zain-ul-'Abidín gathering an army prepared to contest the throne with Muhammad Sháh. He proceeded as far as Rájáorí, but in a battle fought at Adún he was defeated as Jahángír Mákarí kept true to the popular party. In a second battle he was again defeated. He then went to Jammú where collecting an army he prepared to invade Kashmír a second time. Jahángír Mákarí, who seems to have been recognized as the head of the popular party recalled the Sayyids who had been exiled and joined them to his side. In the battle which was fought with Fath Khán many of the Sayyids were slain and the rest remained faithful. So Fath Khán was again defeated. But he was not turned from his purpose. Again collecting an army he a third time invaded Kashmír and was successful. Muhammad Sháh was made over to him and Saifí Wángarí was appointed his keeper. Jahángír Mákarí fled and hid himself. Sayyid Muhammad, the father-in-law of Muhammad Sháh joined himself to Fath Khán. Muhammad Sháh had reigned 10 years and 7 months, Farishtah says, but other authorities say 2 years and 7 months. The copper coins of Muhammad Sháh abound. The dates on the reverse of them in Arabic words are as a rule perfectly unintelligible. His silver coins are very rare. All I have seen yet have had the date in words on their reverse 842 A. H. I have seen four with the date 842 A. H. on the obverse under the name. (See figs. 5 and 6, pl. I and fig. 32, pl. III). They do not help us in the slightest in the history of Kashmír. They only add to our confusion.

Fath Khán came to the throne in 894 A. H. and assumed the title of Fath Sháh. The prince Muhammad Sháh was therefore but a lad of about 10 years of age. (Just about this time in England, Edward V and his young brother were murdered in the Tower. Fath Sháh was not so bad as Richard III. He ordered the food and drink of the prince to be prepared according to his order and gave him a place in the palace along with his own brothers.)

Fath Sháh made Saifí Vánkarí or as another authority has it Saifdár his prime minister. This Saifí was famous for his justice. At this time a new religious teacher named Mír Shamsí came into Kashmír from Persia. He initiated the people in the Shía doctrines under the semblance of teaching Sufíism. After the death of this teacher a quarrel arose between his followers and the other Muhammadans, and to that extent was it carried on, that the rival parties fought in the very presence of the Sultán.

Muhammad Sháh was taken out of prison by Malik Ajhí and Malik Zína, but when they found he was not particularly favourable to their plot, they tried to put him in prison again. Hearing of this he fled to his father's place.

After this Fath Sháh must have become reconciled to his two ministers, for the history says that he divided Kashmír between them and himself, each taking one-third. More than this he made Malik Ajhí his prime minister and Sankar his Chief Justice. (Here we have great confusion. Malik Ajhí is called in other books Malik Gájí or Gází Chakk, while Sáukar or Vánkarí is called Saifdár.) A story is given of the justice of the prime minister. A quarrel had arisen as to the possessorship of a ball of silk. The plaintiff and defendant each swore it was his. The Prime Minister asked whether it had been wound on the fingers or on a spindle. Plaintiff said "on the fingers:" defendant, "on the spindle." They unwound the ball and found that it had been wound on the fingers, hence it was made over to the plaintiff.

After some time had passed Ibrahím the son of Jahángír Mákarí went to Muhammad Sháh and brought him back to Kashmír. A great battle was fought near Kohásála in which Fath Sháh was defeated and he fled by the way of Hírapúr into India having reigned nine years. (There is the greatest confusion in the histories of this period. Saifí reigned in reality not Fath Sháh. A Malik Musá Zína, named above, obtained supreme power. After him Ibrahím reigned 40 days. Then Malik Osmán reigned two months. Then Jahángír Mákarí had an innings. Most of these nobles attained supreme power a second time before Muhammad Sháh's restoration.)

Muhammad Sháh. 2nd Time.—Muhammad Sháh obtaining the throne a second time made his Helper thereto his prime minister and appointed Sikandar Khán his heir. The sons of Ibrahím Mákarí put Malik Ajhí to death in prison. Fath Sháh soon after this returned with a mighty host and Muhammad Sháh not being able to meet him in the field fled without a battle being fought. He had reigned only 9 months and 9 days.

Fath Sháh. 2nd Time.—Fath Sháh on ascending the throne of Kashmír a second time made Jahángír Badrah his prime minister and Sankar Zína his chief justice. He reigned with great judgment. Muhammad Sháh being defeated took refuge with Sikandar Lodí of Dehlí, who sent a large army to help him. Jahángír Badrah being dissatisfied with Fath

Sháh went over to Muhammad Sháh and brought him by way of Rájáorí to Kashmír. Fath Sháh made Jahángír Mákarí general of the van of his army. In the battle which ensued Fath Sháh was defeated, and that general together with his son was slain. Fath Sháh himself fled to India and there died. (The Tawaríkh-i Kashmír places this event in 925 A. H.)

Muhammad Sháh. 3rd Time.—Muhammad Sháh on assuming the reins of government for the 3rd time imprisoned Sankar Zíná and made Malik Gájí Chakk, who was famous for his bravery and wisdom, his prime minister. This Gájí was famous for his discernment. One instance is given. A writer had a wife. By accident he left her for some time. She, during his absence, becoming impatient, married a second husband. On the first husband appearing again on the scene, a quarrel arose. The woman gave the lie to her first husband. To settle the matter, the three resorted to Gájí Chakk. As there were no witnesses, he had recourse to his own wit and said to the woman: "I believe you to be a truthful person and the writer to be a liar, kindly put some water into my inkstand, in order that I may write you a deed of separation from him, that, in the future he may give you no trouble." The woman, who probably cared more for her second husband, put in the water with great care. Gájí again ordered her to put in a little more. She did so, using the same care as before. Seeing her thus desirous of obtaining the ink for the deed of separation, the Malik at once turned to the officers of his court and said—"This woman is the wife of the writer." She at last confessed that this was the truth and the case of the second husband was dismissed, let us hope, with costs. (I have no doubt that Gájí Chakk is Ajhí whose death is announced in the 2nd Time of Muhammad Sháh's rule.* Anachronisms like these abound in the confusion of the period.)

When Muhammad Sháh became finally settled on the throne he punished Saifí Vánkarí and others who had opposed him. Sankar Zíná had died before. The body of Fath Sháh was brought to Kashmír and was buried near the tomb of Zain-ul-'Abidín in 922. (According to Tawáríkh-i Kashmír, 925 A. H.) Malik Gájí Chakk imprisoned Ibrahím, but his son Abdál Mákarí went to India and thence getting help he brought Slkandar Khán the son of Fath Sháh and proclaimed him king. (برداشته بشاهي is the phrase used.) It says nothing about coins or I should be inclined to assign my first silver coin No. 1, pl. I to this Sikandar). Gájí Chakk and Muhammad Sháh made preparations in Nolpín in the Parganna of Máhekal. This was in 931 A. H. Sikandar, not being able to meet them took refuge in the fort of Nágám. Gájí Chakk sent his son Mas'aúd against him but he was killed. Nevertheless Sikandar being unsuccessful in Nágám fled from it. قلعه ناکام گذاشته بنا کام (there is a pun here we cannot reproduce in English). The Mákarí following fled along with him. Muhammad Sháh then became firmly seated on the throne. As usual, the king, listening to Gájí Chakk's enemies, drank in their calumnious accusation, and turned against the man who had made him king: Gájí being under suspicion went off to Rájáorí and there joined the Rájah of that part. During this time Sikandar K͟hán, obtaining help from the Mughal Bábar took possession of Lanharkot. Malik Bárí brother of Gájí Chakk hearing of this attacked him and taking him prisoner sent him to the king, who being pleased with such loyalty became reconciled to Gájí Chakk and restored him again to office. Poor Sikandar had the needle drawn through his eyes and once more Muhammad Sháh was at peace.

It seems that when Muhammad Sháh took refuge with Ibrahím Lodhí at Dehlí he took with him his son Ibrahím K͟hán. This son was kept at Dehlí by the Emperor, while the father was sent to Kashmír with a large army. Now at the time of the affair of Sikandar K͟hán, Ibrahím Lodhí owing to disturbances in Dehlí took refuge in Kashmír. Malik Gájí Chakk, who was displeased with the king for blinding Sikandar K͟hán, by every means he could devise, threw all the courtiers of Muhammad Sháh into prison and then imprisoned the king himself and made Ibrahím K͟hán king. (Here again comes the phrase بشاهي برداشته hence we must own that Sikandar also was proclaimed king and therefore that he probably struck coins.) Muhammad Sháh had reigned 11 years 11 months and 11 days.

Ibrahím Sháh.—Ibrahím Sháh made Malik Gájí Chakk his prime minister. Abdál Mákarí son of Ibrahím Mákarí having fled from the tyranny of Gájí Chakk went to the court of Bábar and asked from him help in the shape of an army wherewith he might conquer Kashmír. This was granted and Shaik͟h Alí Beg and Mahmúd K͟hán were appointed its generals. Abdál perceiving that the Kashmíris would despise the Mughal soldiers pretended he was coming to promote the claims of Názuk Sháh (Nádir?) the son of Ibrahím Sháh. Malik Gájí Chakk, bringing with him the king Ibrahím, advanced to meet Abdál as far as Saláh in the parganna of Bánkul. Abdál sent a message to Gájí saying that as he was come with a Mughal army from Bábar the conqueror of Ibráhim Lodhí, whose army had exceeded five hundred thousand soldiers, it would be well for him at once to swear allegiance to this all-powerful sovereign, or if not to fight at once. Gájí, like a true soldier, preferred to fight. In the battle which ensued the slaughter was very great: many nobles of Ibráhim were slain, amongst whom were Malik Tází and Shere Malik. After the battle Gájí fled to the mountains, and it is not known what became of Ibrahím Sháh: he disappeared no one knows where or how or in what direction. He had reigned 8 months and 5 days. (For a coin of our Ibrahim Sháh, see No. 16, Pl. II.)

Názuk Sháh (Nádir ?).—Názuk Sháh (I retain this word because all the MSS. seem to have it, but all the coins have Nádir) on ascending the throne of his forefathers, set himself to encourage the natives of Kashmír, who were uneasy about the Mughals. The natives were pleased with him and took him to Náoshera the old capital of the Sultáns of Kashmír. Abdál Mákarí became his prime minister. He pursued Malik Gájí Chakk to the confines of Jahalnagarí, but could not take him prisoner. He then returned and busied himself in the settlement of Kashmír. He divided the country into four parts, one he kept himself, one he gave to Shaikh Mír Ali, and one was given to the soldiers. (A MS. in the British Museum adds, one was given to Lanhar Mákari and one to Malik Zangí Chakk.) To the allies he had obtained obtained from Bábar he gave many presents and dismissed them in the direction of India. Then he sent a letter of harsh rebuke to Malik Gájí Chakk, but Muhammad Sháh he again recalled from his prison of Lanharkot and the two entered Kashmír as friends and thus Muhammad Sháh was again set upon the throne.

Muhammad Sháh. 4th Time.—Muhammad Sháh as a tribute of gratitude to Názuk Sháh who had reigned 20 years and 20 months (?) made him the heir-apparent. In this year died Bábar the first Mughal Emperor of Dehlí and he was succeeded by Nasír-ud-Dín Muhammad Humáyún. This we know was in the year 937 A. H. Here we get therefore to land at last. The whole of the reigns of Muhammad Sháh and his rivals is one tangled mass of confusion. There is no reliance whatever to be placed in a historian when he makes a man reign exactly the same number of years, months and days. We read 11 years and 11 months and 11 days and 20 years and 20 months! No two histories agree. One MS. in the British Museum omits Názuk Sháh altogether. Many men undoubtedly ascended the throne in this time of confusion. The date of Abdál Mákarí's invasion of Kashmír with the aid of the Mughals is placed in a MS. in the British Museum at 935 A. H. This would make the reign of Názuk Sháh more like 20 months in length. We may I think take the above date 937 A. H. as correct. After a year Malik Gájí Chakk, who had taken refuge in the mountains returned and beseiged Kakrár, Abdál Mákarí went to meet him and defeating him pursued him to Bhír. At this time the Panjáb was governed by Kámrán, the brother of Humáyún, Shaikh Alí Beg and Muhammad Khán the leaders of the allies who had helped Abdál Mákarí, and who had left him without permission, went to Kámrán and represented to him how easy it would be to conquer

Kashmír by their assistance. Kámrán at once consented to do so and appointed Muharram Beg to co-operate with these two worthies. As soon as the Kashmíris heard of the approach of the Mughals they fled for fear to the mountains leaving all they possessed in their houses. The Mughal soldiers plundered and burnt to their hearts' content: all the Kashmíris who dared to leave the mountains to fight for their homes were slain. At first Abdál Mákarí thought Malik Gájí Chakk was at the bottom of this invasion. When he found, however, that he was not in the Mughal army, he sent for him and his sons and entered into a compact with them. Joining their forces together, the two leaders took heart and, attacking the Mughals, utterly routed them and drove them back to their own country. But after this Malik Gájí Chakk could not endure the prosperity of Abdál, so he betook himself to Bhír and there resided. In this year, which was 939 A. H. (the MS. in the British Museum agrees with this date) the Sultán of Káshgar, Saíd Sháh, sent his son Sikandar Khán together with Mírzá Haidar and 12,000 soldiers by the way of Tibet and Lár to invade Kashmír. The inhabitants, fearing the hardy valour of the central Asians fled from their homes in all directions and took refuge in the mountains. The invaders, finding everything open before them, destroyed the palaces of the olden kings and levelled them with the dust. The city was burnt. The treasury and the buried treasures were plundered; and the whole army of invaders was laden with goods and gold. Wherever the Kashmíris were found hidden they were pursued and slain or imprisoned. This state of things lasted for six months. Meanwhile Maliks Gájí Chakk and Abdál Mákarí, together with other nobles, took refuge in Chakdara. But not agreeing to stay there, they went to Khawara and Báradár. From this place by the way of Bádah they descended from the mountains and engaged in battle with the Mughals, the leaders of whom were quite willing to risk an engagement. The encounter was long and bloody. Many great and brave men on both sides were slain. The Kashmíris at one time wished to turn their backs on the field, but Malik Gájí Chakk exhorted them to play the man and remain firm. They also obtained the aid of more Kashmíris. The slaughter on both sides was awful—the dead were numberless. The struggle lasted from morning till night. In the evening the prisoners were numbered on both sides and were liberated and both armies were ready to accept peace. The Káshgar party, taking with them presents of wool, hawks, and precious things, went to Muhammad Sháh and asked his daughter in marriage to Sikandar Khán, and desired that the women whom the Mughals had in their hands, should there remain. Peace being thus concluded, the central Asians returned to their homes, and peace once more reigned in

Kashmir. In this year two comets appeared and their advent was succeeded by a great famine so severe that many people perished with hunger while others fled into exile rather than remain in their own land to starve. The massacre of Zuljír was regarded no less severe than this famine in its effects. It (the famine) lasted ten months. When the orchards bore fruit it disappeared. No sooner was the country freed from external enemies and internal troubles than the leaders of the people Gájí Chakk and Abdál Mákarí disagreed. The former took up his residence at Zainpúr and the latter remained in office as wazír. Governors and rulers did as they liked. No man obtained justice. After a short time Muhammad Sháh died of fever, having reigned 50 years. Before his death, he distributed all the gold he had amongst the poor of the country. This 50 years must reckon from 891 A. H. and include all the reigns of Fath Sháh and Názuk Sháh.

Shams-ud-Dín.—It seems that this prince Shams-ud-Dín sat on the throne of his father Muhammad Sháh. Guided by his ministers he divided the whole of Kashmír amongst the nobles. The people were pleased with his rule. Gájí Chakk and Abdál Mákárí renewed their disagreement and the former got possession of the young prince and took him in the direction of Kúswár. Abdál Mákarí opposed him, but the two agreeing he withdrew to Kamráj where his states were while Gájí Chakk and the king went to Srínagar. Again Abdál Mákarí showed uneasiness and again quiet was restored. Nothing more is known of the history of this king. (The two coins I assign to him are very poor indeed. Nos. 11 and 12, pl. I. The obverses are so illegible I have not drawn them. I have not seen a copper coin of this king yet. It is just possible that these silver coins may be those of the first Sultán.)

Názuk Sháh. 2nd Time.—After his father Názuk sat on the throne of the kingdom. (His father we are told was Ibrahím Sháh. There is confusion again here.) He had not, however, reigned more than five or six months when Mírzá Haidar Turk, having obtained a firm footing in Kashmír ruled it. In his time the Khutba was read and coins were struck in the name of *Násir-ud-Dín Muhammad Humáyún Bádsháh.* (The coins of Humáyún struck in Kashmír are exceedingly rare. They are exactly of the same type as those of the preceding kings. There are some small differences in the inscriptions in the arrangements of the letters. (See Nos. 13 and 14, pl. I.) One coin has a ح in the field to the right, which I consider to be the first letter of Haidar's name. (See No. 33, pl. III.) The dates of the coins fall within the period during which Mírzá Haidar ruled Kashmír nominally in his master's name. But all these ten years poor Humáyún was a fugitive in Sind and Persia and Affghánistán and he never derived any benefit from the fact that prayers were used in Kashmír with his name in them, and coins current with his name on them.)

In the year 948 A. H. when Humáyún, flying before Sher Sháh Súrí, reached Lahore, Malik Abdál Mákarí, Zangí Chakk and other petitioners wrote about Humáyún's taking Kashmír and sent the letter by the hands of Mírzá Haidar. The emperor dismissed the Mírzá in the direction of Kashmír and gave it out as his intention to follow shortly himself. When the Mírzá arrived at Bhír he was met by Abdál Mákarí and Zangí Chakk. The Mírzá had with him only three or four thousand horsemen, but when he arrived at Rájáorí, Malik Gájí Chakk who was the ruler of Kashmír, arrived at Khabal Kartal (it is called Karmal by Erskine) and entrenched himself with from three to four thousand horsemen and 50,000 infantry. Mírzá Haidar therefore changed his route and went by Pabhaj (the Pamíj of Erskine) which Gají Chakk in his pride had forgotten to defend. The Mírzá crossed the mountains and descending into the plain of Kashmír took possession at once of Srínagar. Abdál Mákarí and Zangí Chakk finding themselves strong, busied themselves with the affairs of the kingdom, and they gave several pergunnahs to the Mírzá. But just at this time Abdál Mákarí, died after recommending his sons to the care of the Mírzá.

After the arrival of Mírzá Haidar in Kashmír, Malik Gájí Chakk went to Sher Sháh Afghán for assistance. He obtained five thousand horsemen, over whom were Husain Sharvání and Ádil Khán; and two elephants. Mírzá Haidar met him between Danahdyár and Káwah, and the zephyr of victory blowing in favour of the Mírzá, the Malik and his Affghán allies fled from the field and took possession of Bahrámgalla.

In the year 950 A. H. Mírzá Haidar settled himself in the fort of Indarkot. Zangí Chakk being suspected by him fled to Gájí Chakk and in 951 A. H. the two set out, in the direction of Srínagar, determined to root out Mírzá Haidar. Bahrám Chakk, son of Zangí Chakk arrived first at Srínagar, but he was easily put to flight by two of the Mírzá's generals, and his disorganized troops falling back on the main army Zangí Chakk and Gájí Chakk also fled and returned to Bahrámgalla. After this the Mírzá employed his army in invading Tibet. He took Lansúr and many other large forts.

In 952 A. H. Gájí Chakk and his son Muhammad Chakk died of fever and ague. This year the Mírza spent in ease.

In 953 A. H. Zangí Chakk fighting with Mírzá Haidar was killed. His head with the head of his son Gází Khán were presented to Haidar.

In 954 A. H. ambassadors came to the Mírzá from Káshgar and he went with many nobles as far as Lár to meet them. In Lár the head of

Khwája Újh son of Masaúd Chakk was brought to him. This man had for the space of seven years been fighting in Kamráj, but at last he had desired peace. Mírzá Mírak, swearing that all should be right, asked him to attend on him to make a treaty. But when Újh came into the assembly he was stabbed by Mírak and he fled to the jungle pursued by Mírak who took his head off and sent it to Mírzá Haidar. Íde Zíná was far from pleased at seeing it, and, standing up in anger said, that after an oath and covenant had been made the slaughter of one man was not neccssary. Haidar replied that he was not privy to the circumstances of the death.

After this Mírzá Haidar turned his attention to Kishtwár. Bandagán Kukah, Muhammad Mákarí and Yahí Zíná led the van. The Mírzá took up his abode at Jhápúr near Kishtwár. The van, doing three days' journey in one descended on Dahlot, where the river winds, and they were not able to ford it, for the enemy too opposed them. The next day the army of Haidar made a diversion to the right in hopes of reaching Kishtwár, but when they reached the town of Dhár, gusts of cold air laden with dust came down upon them, the day became dark and the people of the town made an attack on them. Bandagán Kukah with five other men was slain. The rest of the army with a thousand exertions at last joined themselves with Haidar. The Mírzá was not successful: he was obliged to retrace his steps ingloriously.

In 955 he turned his attention to Tibet. Taking Rájáorí he gave it to Muhammad Nazír and Násir Alí. Paklí he gave to Mulla Abdullah and Little Tibet he gave to Mullah Qásim. Conquering Great Tibet, he appointed Mulla Hasan its governor.

In 956 he took the fort of Danel. At this time Ádam Ghakkar came before the Mírzá and asked him to pardon Daulat Chakk. He agreed to do so and Ádam called Daulat into the tent. The Mírzá, on his coming in, showed him no honour. For this reason Daulat became very angry, and taking away the elephant he had brought as a present, he went away. The courtiers wished to pursue him but the Mírzá forbade them. After some time Haidar returned to Kashmír. Daulat Chakk and Gází Khan and Jai Chakk went to Haidar Khán who had fled from Islám Sháh to Rájáorí. When Islám Sháh who was pursuing the Niyázís arrived at the town of Madawár from Naoshahra, Haibat Khán Niyází sent Sayyid Khán to him. Sayyid Khán making propositions of peace gave up the mother and son of Haibat Khán Niyázi to Islám Sháh who turning back went to the town of Bán near Siálkot and agreed to the conditions. The three Kashmírís above-mentioned then took Haibat Khán to Bárámúla and wished to take him to Kashmír, and carry away Haidar. As Haibat did not see his way to doing this he sent a Bráhman to Haidar with conditions of peace. When he had received a promise from Haidar he went to live at Hír (Nír in MS. No. 6571 opening 190 in British Museum) in Jammú and the Kashmírís went to Islám Sháh. Gh͟ází Khán Chakk, however, went to Mírzá Haidar. (It is evident that at this time the Kashmírís were tired of Haidar. They wished Islám Sháh to be king. We do not read that Islám ever went so far as Kashmír. The nobles, however, must have struck coins in his name, using the formula *struck in Kashmír* on the reverse. I have seen two coins of Islám Sháh of this time. No. 15, pl. I is of this king. It was a common practice to strike coins anticipating events which did *not* come to pass. The date on this coin is 957 A. H. It may have been struck by Haidar as a compliment to Islám Sháh.)

In the year 957 A. H. Mírzá Haidar being at peace with his neighbours sent presents of saffron to Islám Sháh by the hands of K͟hwájah Shams Mughal. In the following year Islám Sháh sent the ambassadors back with presents of silk cloth and goods accompanied by Yásín (Básín in above MS.) as envoy. Mírzá Haidar sent back Yásín laden with shawls and saffron to Islám Sháh.

Mírzá Qarrá Bahádur was appointed governor of Bhirpul (or Bharmal) and along with him were sent from amongst the Kashmírís Ídí Ziná and Názuk Sháh, Husain Mákarí and K͟hwájah Hájí. The whole of these with Mírzá Qarrá came back to Indarkot and went thence to Bárámúla and became rebellious. The reason of this rebellion was that the Mughals (the forces of Mírzá Haidar) were not acceptable to them. When the Mughals informed the Mírzá of this he told them they were no less ready than the Kashmírís to rebel. Husain Mákarí sent his brother Alí Mákarí to Mírzá Haidar to make excuse for the Kashmírís and to call again the army. Haidar was not aware of the condition of things, and told them that the Kashmírís were powerless and that there was no use in calling the army.

On the 27th of Ramzán a great fire burst out in Indarkot. Mírzá Qarrá and his following sent word that their houses were destroyed, and asked for orders saying that if convenient they would rebuild their houses and next year go to Bhirpul. Mírzá Haidar was displeased at this conduct. Nevertheless whether he would or not the army went towards Bhirpul. At night time, however, Ídí Ziná and the rest of the Kashmírís left the Mughals and came to the pass of Bhirpul and took with them Husain Mákarí, Alí Mákarí and others in order that they might not be slain by the Mughals. When it was morning the men of Bhirpul fought with the Mughals who were fastened in the mountains. Sayyid Mírzá fled and went into the fort of Bhirpul. About 80 Mughals, men of note were slain in this affair. Muhammad Nazír and Mírzá

Qarrá Bahádur were captured. The rest of the army came to Bahrámgalla. When Mírzá Haidar heard of this he was sorely vexed and ordered all the silver vessels to be broken and the coin now current in Kashmír was struck from them. Jahángír Mákarí at this time got into favour and the estates of Husain Mákarí were bestowed upon him. Tradespeople had horses and outfits given to them and were made soldiers. After this news came that Mulla Abdullah, hearing of the exodus of the Kashmírís, was coming to Kashmír. When he got near to Bárámúla the Kashmírís crowded on him and slew him. Khwájah Qásim was slain in little Tibet. Muhammad Nazír was imprisoned in Rájáorí. The Kashmírís leaving Behrámgalla came to Hambarapúr. Mírzá Haidar was thus forced to fight them and he came to Indarkot. He had with him only a thousand men. With him were Mughal nobles who had 700 men more. The whole took up a position in Shaháb-ud-Dínpúr. Daulat Chakk and Ghází Khán Chakk went to Hambarapúr to help Ídí Ziná and coming from that place assembled in Khánpúr. Mírzá Haidar took up his position in the plain of Khálidgarh near Srínagar. Fath Chakk, whose father had been slain by the Mughals, Khwájah Bahrám brought, with 3,000 men to Indarkot to revenge his father's death. They burned all the palaces of Mírzá Haidar in the Safá gardens. When Mírzá Haidar heard of this he said, "I have not brought this from Káshgar that I might by the grace of God, again build it." Jai Alí in revenge burnt the palaces of Zain-ul-'Ábidin in Suryápúr, but this did not please Mírzá Haidar and the army burnt the palaces of Ídí Ziná and Nauroz Chakk in Srínagar. Mírzá Haidar himself took up a position in Khánpúr in which place was a willow tree under which 22 horsemen could stand. If one branch of this tree were shaken the whole tree was moved. At last the Kashmírís came from Khánpúr and took up a position at Adnipúr and not more than a distance of two kos remained between the two armies. Mírzá Haidar determined to make a night attack on the enemy. He first of all made his own younger brother Mírzá Abdur Rahmán his heir-apparent and inaugurated him, then getting his men into order he prepared for the night attack. It so happened that the night was very cloudy and when he got to the tent of Khwájah Hájí who was the soul of the rebellion and the agent of the Mírzá, the darkness hid everything. Sháh Nazar a cuirassier of Mírzá Haidar said, "When I shot an arrow the voice of the Mírzá fell on my ear, saying, 'you are at fault.' I then knew that the arrow had accidentally struck the Mírzá." It is also said that a butcher shot him in the thigh with an arrow. In another tradition it is stated that Kamál Kúka killed him with a sword. But except an arrow-wound in his heart no other thing was visible. In reality this is the sum of the traditions. When morning dawned it became noised abroad amongst the Kashmíris that a Mughal was lying slain in their camp. When Khwájah Hájí came to view the corpse, he said it was that of Haidar. He held up the head from the earth but nothing but the last breath remained. He moved his eyes and gave up the ghost. After this the Mughals fled to Indarkot and the Kashmíris buried the corpse of Haidar and then pursued the Mughals. They took refuge in Indarkot and for three days defended themselves. On the fourth day Muhammad Rúmí loaded the cannon with copper coins and fired them on the enemy. Every one who was struck with them died. At last, however, Khánmai, the widow of Mírzá Haidar, and her sister Khánjí spoke to the Mughals and said, "Inasmuch as Mírzá Haidar has departed from our midst, it would be better to make peace with the Kashmíris." The Mughals agreed to this and sent Amír Khán, builder, to the Kashmíris to ask for peace. The Kashmíris were pleased at this and wrote a letter with oath and covenant that they would not persecute the Mughals any more. The government of Haidar Turk lasted for ten years.

Názuk Sháh. 3rd Time.—When the doors of the fort were opened, the Kashmíris went into the treasury of Mírzá Haidar and plundered it, taking away the beautiful and delicate garments it contained. The family of the Mírzá was taken to Srinagar and placed in the hands of Manújá. The Kashmírí chiefs then divided Kashmír between themselves. Daulat Chakk got the pargannah of Deosar, Ghází Khán the pargannah of Wáhí; Yúsuf Chakk and Bahrám Chakk obtained Kamráj. Khwájah Hájí the wakíl of the Mírzá took a lákh of shawls and the whole of the nobles of Kashmír, but especially Ídí Zíná, took the government of the province into their hands. Názuk Sháh as a kind of shadow of a king was upheld in name. In truth I'dí Zíná was king. (coin No. 10, pl. I. I attribute to this period. It is struck in the name of *Nádir* Sháh. The reverse bears the date 957 A. H. and was probably struck from an old die of Haidar's, see Nos. 13 and 14 which were struck by Haidar in the name of Humáyún. The only sign I can find of Haidar on the coins is the solitary خ I have before mentioned on coin No. 33, pl. III.)

In 959 A. H. Sankar Chakk son of Gájí Chakk who was without any estates, while Ghází Chakk who called himself the son of Gájí had many, desired to leave Kashmír. The whole story is this, Sankar Chakk was without any doubt or question the son of Gájí Chakk. Ghází Khán Chakk, although he was called the son of Gájí, in reality was not his son. For Gájí after the death of his own brother Hasan Chakk took to wife the widow who was then with child. Two months after Ghází Khán Chakk was born. Hence Sankar Chakk wished to leave Kashmír (*i. e.*, I suppose the city of Kashmír or Srínagar) and repair to Ídí Ziná. When this got wind, Daulat Chakk and Gházi Khán Chakk sent Ismá'íl Hánit and Harjú with 100 men to call back Sankar Chakk, telling them to bring him by force if he would not come otherwise. He would not come, but fled to Ídí Ziná. In the end Sankar Chakk had given to him the jágírs of Kothár, Kháwin and Madurú and was thus satisfied, and so the disturbance was quelled.

In those days there were four parties in Kashmír (1) Ídí Ziná and his party, (2) Hasan Mákarí son of Abdál Mákarí and his party, (3) the Kapúrís who were composed of Bahrám Chakk, Yusuf Chakk and others, (4) the Kásís who were Gájí Chakk, Daulat Chakk and Gházi Khán Chakk. In order to strengthen the Chakk interest, the following marriages took place:—The daughter of Yahí Ziná married Husain Khán son of Gájí Chakk; the daughter of Daulat Chakk married Muhammad Mákarí son of Abdál Mákarí; and the sister of Yúsuf Chakk son of Zangí Chakk married Gházi Khán Chakk. Being thus united for a short time the usual result followed, they quarrelled and separated. Gházi Khán Chakk went to Kamráj, Daulat Chakk to Súrpúr, the Mákarí faction to Pákul. By reason of this quarrel Ídí Ziná remained in a state of grief in Srínagar. When the egg-plant came in season Ídí Ziná ordered fowl to be cooked with the fruit: this kind of food is delicious and the Kashmírís like it. Afterwards when Bahrám Chakk and Sayyid Ibráhím and Sayyid Yaqúb accepted his invitation to dine off the above-mentioned viands (but Yúsuf Chakk would not accept the invitation), Ídí Ziná seized the three and put them in prison. Yúsuf getting to hear of this fled to Daulat Chakk at Kamráj, taking with him 3,000 horsemen and 700 infantry. When Ídí Ziná saw that the Kashmírís were going over to the Chakk faction, he set free from prison the Mughals Mírzá Qarrá Bahádur, Mírzá Abdur Rahmán, Mírzá Ján Mírak, Mírzá Yakla, Mír Sháh, Sháhzáda Beg Mírzá, Muhammad Nazír and Jar 'Alí, and supplied them with horses and armour and pay and took up a position at Chakkpúr. Meanwhile the Sayyids Ibráhím and Yaqúb, by the help of their troopers, escaped from prison and joined Gházi Chakk at Kamráj. Bahrám Chakk was not able to escape. The next day Gházi Khán Chakk came to Srínagar with 30 cavalry and kept up a constant fight with Ídí Ziná from the Ídgáh where he had taken up his position. Ídí Ziná sent the Mughals against him. He, however, destroyed all the bridges and the Mughals did nothing. Meanwhile Daulat Chakk came to help Gházi Khán. At last Bábá Khalíl went to Ídí Ziná and said, "You trust the Mughals and drive the Kashmírís from your sight. This is not expedient." Accordingly Ídí Ziná made peace with the Kashmírís and dismissed the Mughals and their families. Khánjí, the sister of Mírzá

Haidar went by the way of Paglí to Kábul and the families of Jar 'Alí and others were put to the sword. K͟hánam fled to Káshgar. After this news came that Haibat K͟hán and Sayyid K͟hán and Shahbáz K͟hán Affghans of the Niyází tribe were invading Kashmír and that they had arrived at the salt range in the pargannah of Bánihál. I'dí Ziná Husain Mákarí, Bahrám Chakk, Daulat Chakk and Yúsuf Chakk, joining their forces together, opposed the Níyázís. The two parties fought well, Bíbí Rába, the wife of Haibat K͟hán Niyází joining the fight and striking 'Ali Chakk with her sword. At last, however, she and the three Níyází leaders were slain and the Kashmírí allies returned to Srínagar flushed with victory. They sent the head of the Affgháns to Islám Sháh Súrí by the hands of a man named Yaqúb. After this of course the allies disagreed. I'dí Ziná took up his residence in K͟hágarh together with Fath Chakk, Lauhar Mákarí, Yúsuf Chakk, Bahrám Chakk and Ibráhím Chakk. Daulat Chakk, G͟házi Khán Chakk, Husain Mákarí and Sayyid Ibráhím joining themselves together settled in the I'dgáh. Two months passed thus. Then Yúsuf Chakk, Fath Chakk and Ibráhím Chakk left I'dí Ziná and joined Daulat Chakk, who finding himself thus supported attacked I'dí Ziná who not being able to oppose him fled, without trying the chance of a battle, to Merv. Wishing to change horses, by accident a horse kicked him in the breast and at Simálc he disappeared altogether, *i. e.*, he died in that place and his corpse was brought to Srínagar and buried in the village of Músá Ziná. The nobles then deposed Názuk Sháh who was king only in name, and began to govern the country on their own account. Názuk Sháh, this third time, reigned ten months.

Ibráhím Sháh II.—Ibráhím II* was the son of Názuk Sháh. As I'dí Ziná had departed this life, Daulat Chakk came into the capital and took upon himself the affairs of the kingdom. Inasmuch as he deemed it expedient to have some one king in name he set up Ibráhím Sháh that he might rule nominally under him. At this time K͟hwájah Hájí the wakíl of Mírzá Haidar left Khaigal and took refuge with Islám S͟háh. At the same time Shams Ziná and Bahrám Chakk were thrown into prison. At the 'I'd-i Fitr, Daulat Chakk went to practice archery outside the city. Yúsuf Chakk was also there and riding on his horse. A foot-soldier who was gathering arrows got entangled in the horse's legs and Yúsuf was thrown from his horse and his neck was broken.

In 960 A. H. Daulat Chakk and G͟házi K͟hán Chakk again disagreed and the whole of Kashmír was involved in the quarrel. Husain Mákarí and Shams Ziná who were in Hindustán in 961 returned and joined themselves to G͟házi Khán Chakk. Bahrám Chakk and the sons of Yúsuf Chakk joined themselves to Daulat Chakk. These dissensions and quarrels lasted two months. At last a husbandman assuming the garb of an ambassador came to Daulat Chakk and said, "Ghází Khán Chakk has sent me to ask why you keep all these men near you for they are all your enemies." To Ghází Khán Chakk he said, "Daulat Chakk is willing to accept peace why still stir up strife?" This trick succeeded and produced peace. Shams Ziná again fled to India.

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* Coin No. 16, pl. II may be of this Ibráhím. All the coins with name Ibráhím on them seem to possess the date 842 in Arabic words.

During these times the inhabitants of Great Tibet made an incursion into Kashmír and drove away the flocks of sheep of the pargannah of Kháwan and Bára which were in the estates of Habíb Chakk the brother of Nasrat Khán Chakk. On account of this Daulat Chakk, Sankar Chakk, Ibráhím Chakk, and Haidar Chakk the son of Ghází Khán Chakk and other nobles together with an army were sent by the way of Lár to Great Tibet. Habíb Khán Chakk who was with the army, going by the way the sheep had been driven, used such expedition that he fell suddenly on the fort of Great Tibet and took it killing the governor. The garrison all fled. Habíb Chakk told his brother Darvesh Chakk to scour the country but he neglected to do this. Habíb, however, in spite of unhealed wounds, mounting his horse, took palaces and forts and the inhabitants of Great Tibet, not being able to withstand him, submitted. In one of the palaces forty persons were taken on the roof. Much importunity was used to preserve their lives. 500 horses, 1,000 pieces of pattú, 50 yaks, 200 sheep and 200 tolahs of gold were offered in their stead, but Habíb Khán would not give ear to their words: he slew the whole of the forty. Riding away from that fort he went to another which suffered the same fate. The inhabitants of Great Tibet then sent him for his acceptance 3,000 horses, 500 pieces of pattú, 200 sheep and 30 yaks. He also took from the Tibetans some five Káshgarí horses which had fallen into their hands. Haidar Chakk, son of Ghází Khán Chakk sent Khání his foster-brother to Habíb and told him that as the Tibetans were minding these Káshgarí horses for his father Ghází Khán, it was necessary that the horses should be sent to him in order that he might forward them to his father. Habíb Chakk sent nearly 200 men with the horses in order that they might quarrel among themselves in the way, but they would not do so, and at last they arrived in Srínagar with their charge.

In the year 962 a great earthquake committed much ravages in Kashmír. Many towns and villages were destroyed. Nílú and 'Adampúr were washed away by the river Jhelum. In the town of Máwur which is situated at the foot of the mountains there was a great landslip which killed nearly 600 persons.

Ismáil Sháh.—When five months had passed of the reign of Ibráhím Sháh, who was in truth the agent of Daulat Chakk, Ghází Khán Chakk took the affairs of the kingdom into his hands and Daulat Chakk was defeated and blinded. (I cannot tell which are the coins of Ibráhím Sháh I, and which of Ibráhím Sháh II. They are all like No. 16, pl. II, the date is 842 in Arabic words.) Ghází Khán set up Ismáel Sháh on the throne in 963 A. H. (For coin of Ismáil see No. 17, pl. II. Date 842 in Arabic words.) In that year Habíb Khán Chakk desired to join himself to Daulat Chakk and with his intention went towards Mardádún. Ghází Khán Chakk then said to Nasrat Chakk brother of Habíb, it would be as well for us to seize Daulat Chakk before your brother comes, for afterwards it will be difficult to do so. Once upon a time Daulat Chakk going on board a boat, went to a pond in the lake that he might kill water-fowl. Ghází Khán coming after him took his horses, and when he fled to the mountains pursued him and taking him prisoner blinded him. After this Habíb Khán Chakk came and Ghází Khán who was not pleased with him gave Názuk Chakk the nephew of Daulat Chakk much inconvenience and trouble. He was not at all at ease about the blinding of his uncle and for that reason Ghází Khán Chakk wished to imprison him, but Názuk, getting news of this fled to Habíb Khán Chakk. (For coin of Ismáil Sháh, see No. 17, pl. II.)

Habíb Sháh son of Ismáíl Sháh.—After Ismáil Sháh had reigned two years he died. Ghází Khán elevated his son to the throne. Towards the end of 964 A. H. Nasrat Khán Chakk, Názuk Chakk, Sankar Chakk, brother of Ghází Khán Chakk, Yúsuf Chakk and Hastí Khán Chakk met together and took an oath and covenant to this effect that as Ghází Khán Chakk was eaten up by physic, and his brother Husain Chakk is in prison, we will release *him* and slay Ghází Khán. Ghází got to hear of all this. Appeasing Yúsuf and Sankar Chakk he called them into his presence. Habíb Khán Chakk, Nasrat Khán Chakk, and Darvesh Khán Chakk said they would like lawyers and learned men to plead for them, and then come or flee as it pleased them. Nasrat Chakk came without any promise being given him and was at once imprisoned. Habíb Chakk and Názuk Chakk destroyed the bridges and departed. Hastí Khán Chakk with all his followers joined them. Ghází Khán sent a large army against them and a great battle resulted. His army was beaten and several were taken prisoners. Habíb Khán being victorious departed to the mountains of Mámún. After the defeat his army had sustained, Ghází Chakk took the field himself in order that he might defeat Habíb; and he went to Badúmara. Thence by water with 3 elephants and 3,000 men he went to the plain Khálidgaṛh. Habíb Khán here opposed him with twenty men, but after a hard fight he was compelled to flee. At the bridge of the Jamja his horse stuck fast. Meanwhile an elephant driver of G͟hází K͟hán Chakk came up and took him prisoner. G͟hází K͟hán Chakk told him to take off his head. He tried to do so, but Habíb got the man's hand in his mouth and held it in his teeth. At last, however, he managed to sever his head from his body, and he carried it to Kala, the name of his residence and hung it there on the door. Darvesh Chakk and Názuk Chakk also fell into their hands and were treated similarly. After this Bahrám Chakk returned from India and the jágír of Khuba Hámún was given to him. Getting permission he left Srínagar and went to his birthplace Dauchа in the parganneh of Zaingarh. Sankar Chakk, Fath Chakk and others soon joined him and going to Súbapúr they raised the standard of rebellion. G͟hází K͟hán Chakk sent his sons and brothers against them. They were not able to oppose them and fled to the mountains. G͟hazí K͟hán sent his party after them and ordered them to pursue until they captured. The next day news came that Bahrám Chakk had escaped from Sarkob, and that Sankar Chakk and Fath Chakk had left him. G͟hází K͟hán himself pursued them to Khoba Hámún and for six days searched everywhere for Bahrám Chakk, but he was not taken. However Ahmad Jozín brother of Haidar Chakk son of G͟hází K͟hán Chakk agreed to pursue Bahrám until he took him, so G͟hází K͟hán returned to the city. Ahmad Jozín went to Sarkob the residence of the Ríshís or Sufís and arrested them and made enquiries about Bahrám. The Ríshís said they had placed him in a boat and conveyed him to the residence of Amír Zíná in Bádelí. The Ríshís are a people who are engaged at all times in agriculture and tree planting. When Ahmad Jozín came to Amír Zíná after much search he succeeded in arresting Bahrám Chakk whom he took to Srínagar where the people killed him and Ahmad Jozín was elated with his success. In those days Sháh Abulmuálí who had fled from Lahore, and had been imprisoned by the Ghakkars managed to escape with the fetters still on his feet. Making friends with Kamál K͟hán Ghakkar, he, after the fashion of Mírzá Haidar, desired to invade Kashmír. When he arrived in Bájáorí a company of Mughals met him. The blinded Daulat Chakk, Fath Chakk and others of the Chakk faction and Lauhar Vángarí all joined Sháh Abulmuálí and in 965 A. H. he set out for Kashmír. When he arrived at Bárámúlla Haidar Chakk and Fath Chakk who were guarding the pass fled and went to Bádúkhí. The Sháh proceeding justly, would not allow any of his soldiers to oppress the people. G͟hází K͟hán Chakk making his brother Husain Chakk leader of the van, himself took up a position at Khanúd. The Kashmírís who were with Sháh Abulmuálí left him without leave and attacked Husain Chakk and caused him to flee. G͟hází K͟hán Chakk went to his assistance and fighting bravely many Kashmírís were slain by him and the battle turned in his favour. Sháh Abulmuálí seeing this state of things fled without further resistance. In his flight his horse became very tired, but a Mughal whom he came across gave him a fresh one and took the tired one and stood with it on the road. When the Kashmíris who were pursuing Abulmuálí came up to the place he held them all at bay for some time until, his quiver becoming empty, they rushed upon him in a mass and slew him. During the delay Abulmuálí escaped. Ghází Khán returning arrived in Bádúkhí and every Mughal whom they brought to him he beheaded. But the Háfiz Mírzá Husainí who was from the singers of Humáyún he did not slay on account of his good singing. After this Nasrat Khán Chakk was liberated from prison, and sent into the service of Jalál-ud-Dín Akbar, where becoming acquainted with Bairám Khán he tried to ingratiate himself in his favour.

In 966 A. H a change came over the disposition of Ghází Khán Chakk and resulted in much oppression and violence to the people who all became opposed to him. He by chance heard that his son Haidar Chakk wished to take the kingdom of Kashmír from him. So he called his wakíl Muhammad Janíd and Bahádur Bihut and sent them to admonish his son and advise him to put such imaginations out of his head. They went to him and petitioned him. But Haidar Chakk snatched a dagger out of Muhammad Janíd's girdle and buried it in his stomach. People flocked in and arrested Haidar and took him to his father who ordered him to be executed and his body to be suspended on a door in Zínágarh. All who joined him also were executed.

In 967 A. H. Mirzá Qarrá Bahádur came from India with a large army and nine elephants For three months he stayed in Lálpúr. From the Kashmíris Nasrat Chakk, Fath Chakk and others, and from the Ghakkars also a large body joined him. He evidently hoped that a lot of Kashmíris would join him But meanwhile the leaders who had come in deserted him and went over to Ghází Khán. By reason of this desertion there was much indecision in the invading army. Ghází Khán coming from Kashmír arrived in Naurozkot and sent his infantry against the invaders and defeated them. Mírzá Qarrá fled to the fort of Daira. The next day he again fled before the attack of infantry and his elephants fell into the enemy's hands while five hundred Mughals were killed.

Five years had passed of the reign of Habíb Sháh when Ghází Khán Chakk determined to put him on one side and unfold the royal banners in his own behalf. Ceasing to act therefore in the name of another, he ordered the Khutba to be read and coins to be struck in his own name, taking the title of Ghází Sháh.

(I have never seen a coin of any metal with Habíb's name on it. None of my numismatic friends have one. And yet he reigned five years. I am inclined to think that the coin with the name of *Mahmúd* on it was struck by him. I read the date on this coin as 961 A. H. See fig. 18, pl. II. The unit word and figure are both almost gone. The reverse of No. 28, pl. I, is, however, precisely similar and gives 961 undoubtedly which is two years before the accession of Akbar. No wonder the Rev. J. Loewenthal said, "There is, however, great confusion in all the dates of Kashmírian History," p. 280, I. A. B. S. 1864. Naráyan Kol states that Habíb K͟hán became king of Kashmír in 960. In 961 he committed great mistakes in the administration of justice, so that the pillars of State became ashamed of him. Hence 'Alí K͟hán put the crown on the head of G͟hází K͟hán his brother. This was the beginning of the Chakk dynasty. 'Azam puts the beginning of the Chakk dynasty in 962 A. H. He calls Habíb son of Ismáil Sháh while Naráyan Kol gives Shams-ud-Dín (Ismáil's brother) as the name of his father. If Naráyan Kol be correct then the coin of Mahmúd may be assigned to Habíb. It is not uncommon for a king to rule in one name and for his coins to bear another. The Islám Sháh of the coins is the *Salím Sháh* of history. There is, according to Lieutenant Newall, an inscription of Habíb's in Kashmír dated 981 A. H. I. A. B. S. 1864. But Newall himself makes Habíb die in 1557 A. D. = 965 A. H. By the way he calls Nádir Sháh Tarkh Sháh. For my text I am indebted to Farishtah and I have followed him. Naráyan Kol cannot be right as to the length of Habíb's reign. For as we have seen Akbar was reigning in India and he ascended the throne in 963 A. H. When authorities are so conflicting and coins cannot be trusted, it is hard to come to a decision as to what is correct.)

Ghází Sháh.—G͟hází Sháh by reason of leprosy had lost his voice, his fingers were nearly dropping off and his teeth were much decayed. In 968 A. H. Fath Chakk, Lauhar Vánkari and other Kashmíris coming under the suspicion of G͟hází Sháh betook themselves to the mountains. Husain Chakk brother of G͟hází Sháh was sent with 2,000 men to pursue them. As it was winter the rebels perished: some few who escaped fled to Khatwár, but becoming uneasy there, they sought refuge with Husain Chakk who entreated forgiveness for them from G͟hází Sháh, who not only forgave them but bestowed lands on them. In 970 G͟hází Sháh, leaving Kashmír went to Lár. Thence he sent Fath K͟hán Chakk, Násir Kibatu and his own son Ahmad K͟hán together with some nobles to invade Great Tibet. When they got within five koss of Tibet Kalán, Fath K͟hán Chakk, without obtaining permission from Ahmad K͟hán left the army and went into the city. Inasmuch as the Tibetans did not desire war, they were ready to make great presents to him, and he quickly came out from the midst of them. Ahmad K͟hán seeing this said to himself, that inasmuch as Fath Khán has entered Tibet and returned, why should I not do the same? All Kashmír would praise me. He therefore determined to go alone. Fath Chakk remonstrated with him, and told him that if he were determined to go he ought not to go alone. He would not listen to him, and went accompanied but by 500 men. Fath Khán retired. The Tibetans seeing Ahmad coming alone, attacked him and he not being able to withstand them, fled to Fath Khán and ordered him to the rear-guard of the army for the day while he pressed forward without delay. The Tibetans still pressed on, and when they found Fath Khán alone, engaged him in battle. He, fighting with all zeal and alone, was slain. Ghází Sháh hearing this news was exceedingly angry, and turned away his face from his son as was meet after such conduct. The reign of Ghází Sháh was cut short after four years.*

Sultán Husain Sháh.—The "Táríkh-i-Kashmír" says Husain Sháh, ascended the throne in 971 A. H. Two coins Nos. 20 and 21, pl. II, give 970. I prefer the testimony of these coins to that of the historians. The date is duplicated, it is given once in Persian words and once in figures and both dates agree.

Husain Sháh was the brother of Ghází Sháh. In 971 A. H. Ghází Sháh invaded Great Tibet and took up a position at Muladghar. On account of his being a victim of leprosy he lost his eyesight. He made it a habit to oppress his subjects and from innocent people exacted heavy fines. By reason of this his subjects were estranged from him and formed themselves into two companies against him. One faction followed Ahmad Khán his son, and the other his brother Husain Chakk. When Ghází Sháh heard of this he returned from his expedition to Tibet and re-entered Srínagar, and as he showed greater friendship to Husain Chakk he placed him on the throne instead himself, and the whole of the nobles and ministers came to the house of Husain and gave in their firm allegiance to him. After 15 days Ghází Sháh divided the whole of his robes and goods into two parts, one part he gave to his own sons, the other to shopkeepers telling them to give him their value. The shopkeepers at once resorted to Husain to ask for justice. Husain advised Ghází Sháh to desist from making his demand. On this Ghází wished that he had made his own son his successor. Husain hearing this summoned Ahmad Khán, Ghází's son and Abdál Khán and others of the family to his presence, and made them take an oath and give their word to obey him. Ghází Sháh being ashamed at this attempt to subvert the king called round him a party of Mughals and formed a faction of his own. Husain remained firm and opposed him. The headmen of the city and towns intervened and extinguished the flame of rebellion. Ghází Sháh, leaving the city, took up his abode at Rahínpúr and after three months again came into Srínagar. Husain Sháh being firm in his government divided Kashmír into portions. In 972* he sent his eldest brother Sankar Chakk to Rájáorí and Naushahra which he gave him in jágír. But after this he heard that Sankar had rebelled. For this reason he gave the jágír to Muhammad Mákarí and sent an army under Ahmad Khán and Fath Khán Chakk, Khwajah Masaúd and Mának Chakk against Sankar and they gradually became victorious. Husain Khán went out to meet them and brought them to Srínagar, but after awhile it came to his knowledge that Ahmad Khán and Muhammad Khán Mákarí and Nasrat Khán Chakk had determined to assassinate him. He therefore wished to arrest them. They, getting to know of this, came in a body before Husain, who knowing they were acquainted with his purpose sent Lodní Lond to them, that he might get them all in one place and make each person take an oath that he would have enmity with no second person. The Malik did his business well and made them all inclined towards peace, and they all came into the house of Ahmad Khán and inasmuch as this last named gentleman had not seen Husain Sháh for some time they determined to carry him into the king's presence. Ahmad Khán with much flattery consented and together with Nasrat Khán Chakk and Malik Lodní Lond they went to the palace of Husain. The Qází Hábíb, who was of a city family and Muhammad Mákarí being present, the assembly was held. When evening came Husain told them he was going to have a game and that they might withdraw to the upper room and enjoy themselves and he would shortly join them. When they had gone to the upper room he ordered some persons to imprison them. After this he sent 'Alí Khán and Khán-i-Zamán whose real name was Fath Khán against Sankar Chakk with a large army to Rájáorí. They defeated him and returned victorious. Khán-i-Zamán, getting all power into his hands, ordered all the nobles every day to put in an appearance at his house. In the year 973 A. H. people calumniated the Khán before Husain Chakk so that he commanded that no one should visit him. The Khán was making preparations for leaving Kashmír when Husain Mákarí coming to him asked him, "Why do you leave the country? Husain Sháh has left his palace to go hunting. You can now seize the whole of his goods and treasures." These words pleased the Khán and with the aid of Fath Chakk, Lauhar Vankarí and the like of them he went to the palace of Husain

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* For coin of Ghází Sháh see No. 18, pl. II. Dr. Stulpnagel has I believe the only duplicate known. Mine from which I drew No. 19 is now in the British Museum.

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* Coin No. 22 is dated 972 A. H.

Sháh and set fire to the doors and tried to deliver Muhammad Mákarí, and Ahmad Khán and Nasrat Khan from prison. At that time Masaúd Mának, who was superintendent of the prison, threw water into the hall of the palace until it became mud. Daulat Khán, a follower of the Chakks, putting on his quiver stood ready. Bahádur Khán, the son of Khán-i-Zamán rushed upon him and struck at him with his sword, but it alighted on his quiver. Daulat Khán let fly an arrow which struck the horse of Bahádur in the eyes and caused it to rear so that Bahádur was unhorsed. Musaúd Mának at once cut off his head and Khán-i-Zamán who was standing outside fled. Masaúd Mának pursued him and took him prisoner and led him into the presence of Husain Sháh. The king commanded that they should take him to Zínágarh, and there cut out off his ears and nose and hands and feet and hang the body on a door. Calling Masaúd Mának his son, he gave him the title of Mubáriz Khán, and with it the jágír of Bálkul.

In the year 974 A. H. Husain Sháh gave orders that Ahmad Khán son of Ghází Sháh, Nasrat Khán Chakk and Muhammad Khán Mákarí should all be blinded. Ghází Sháh made every exertion to get this order reversed, and as he was sick he died. Husain Sháh then founded a school and sought the company of the pious and learned. To a party of these he gave Zainpúr as a jágír.

In 975 A. H. Husain Sháh heard from Lodní Lond that Masaúd Mának Mubáriz Khán had spread abroad that "inasmuch as the king has called me his son, he must also give me a portion of his treasure." Husain Sháh was exceedingly troubled on hearing this and went to Musaúd's house, where, seeing many horses in the stable his mind turned altogether against him, and he ordered him to be imprisoned and Lodní Lond was honoured with the offices and position Masaúd had enjoyed. He did not long enjoy his honours for he embezzled 40,000 ass-loads of shawls belonging to government, and was in consequence put in prison and 'Alí Kúka received his post.

In 976 A. H. Qází Habíb, of the Haníff sect, on a Friday, leaving the Juma Masjid, came to the ziárat in the graveyard of Yáíkoh Márán. There, a man of the Shía religion attacked him with a sword and wounded him in the head. Again he struck him and the Qází raising his hand to protect his head had his fingers cut off. Except difference in religion these two had nothing else between them. Malána Kamál, son-in-law of the Qází, was also with him engaged in reading. Yúsuf after wounding the Qází fled and Husain Sháh, who was himself a Shía, when he heard of the affair ordered Yúsuf to be imprisoned and brought before him. A company of lawyers such as Mulla Yúsuf, Mulla Fíroz and the like were assembled, and the King asked them to decide according to the law in the matter. They said that the killing of such a person by way of punishment was allowable. The Qází said, "I am alive. The killing of such a person is not allowable." At last, however, they stoned Yúsuf. By accident at that time there came to Kashmír some co-religionists of Yúsuf,—Mírzá Muqím, and Mír Yaqúb son of Bábá 'Alí as ambassadors from the court of the Emperor Jalál-ud-Dín Muhammad Akbar. Whey they arrived at Hírapúr Husain Sháh Chakk erected his tents. When he heard that they were near he left his tent and went out to meet them, and then bringing them in took his seat by their side. After this the ambassadors went by boat, accompanied by Husain's son to Kashmír while Husain returned on horseback. The house of Husain Mákarí was appointed for them. After a few days Mírzá Muqím who was a co-religionist of Yúsuf said that as the Qázís have killed Yúsuf, you had better send them to me. They were accordingly sent. Qází Zain, who was of the same religion as Yúsuf, said, that the lawyers had made a mistake in their sentence. The lawyers replied we did not give the sentence of death absolutely, we said that to execute such a person was allowable by way of punishment. Mírzá Muqím treated their answer with contempt and gave the lawyers into the hands of Fath Khán Chakk, who tortured them. Husain Sháh went by boat to Kamráj. Fath Khán Chakk acting on the orders of Mírzá Muqím executed the lawyers, and tying ropes to their heels he ordered their bodies to be dragged up and down the streets and lanes of the city.

Husain Sháh sent his own daughter as a gift by the hands of the ambassadors to Jalál-ud-Dín Muhammad Akbar, and in that way showed his acknowledgment of Akbar's supremacy.

In the year 977 A. H. news arrived in Kashmír that Akbar had put to death Mírzá Muqím as a recompense for his causing the death of innocent persons in Kashmír. The daughter of Husain Sháh was returned being rejected of Akbar. Husain Sháh, hearing this news was seized with a bloody-flux and lived only three or four months afterwards.

'Alí Sháh.—At that time Muhammad Khán and Bihut Yúsuf son of 'Alí Khán Chakk determined to go to 'Alí Khán Chakk who was in Sonpúr. When Yúsuf went to that place others also gradually fled to 'Alí Khán. Husain Sháh sent messengers to 'Alí Khán to know what he had done "thy son has received no injury I send him to you." 'Alí gave answer that "he had done nothing also. People of themselves have fled to me. Although I advise them to return it is of no use." At last 'Alí took the road to Srínagar and waited about 7 koss from the city. Lodní Loud there joined him having fled from Husain Sháh, who leaving the city had pitched his tents at a distance from it of about a koss at

Jalahájam. That same night he was deserted by Ahmad and Muhammad Mákarí who fled to 'Alí Khán. Then Daulat Chakk who was one of those near to Husain said to him, "Inasmuch as everybody is leaving us, it would be better to send all the royal insignia, about which the quarrel is, to 'Alí Khán Chakk who is your brother and not a stranger." Husain Sháh at once sent the royal umbrella, the yak's tail and all the insignia of royalty to 'Alí Khán, by the hands of Yúsuf, saying, that his only sin was that he was sick. After this 'Alí Khán went to the house of Husain and visited him. Both shed tears. Husain gave up the city into the hands of 'Alí and went to live at Zainpúr, and 'Alí assuming the title of 'Alí Sháh, took upon himself the affairs of the kingdom. After three months Husain died. 'Alí Sháh followed the bier to the grave which was dug near the Hairán Bázár.

In those days a darvesh named Sháh 'Árif arrived in Kashmír from Lahore. He gave out that he was descended from Tahmásp king of Persia. He was a Shía and was dressed in the garb of a faqír: he was a Súfí also. He had left Husain Qulí Khán Turkmán the governor of the Panjáb. 'Alí Sháh who was a Shía considering himself honoured by this visit expressed his pleasure and besought the holy man to marry his own daughter. He also called him the Mahdí of the latter days. 'Alí Chakk, Nauroz Chakk and Ibráhím Chakk son of Ghází Sháh were all so pleased with him that they not only believed on him but actually worshipped him and at last, considering him worthy, determined to make him their king. 'Alí Sháh getting to hear of this was very vexed and proceeded to severe measures. Sháh 'Árif who was famous for his knowledge of alchemy and his power over fairies, saw how the wind was blowing and gave out that he would no longer stay in Kashmír but would depart to Lahore or some other country in a day. After this he lived in seclusion, until people thought he had disappeared miraculously, but after three days it came out that he had given two ashrafís to a boatman to take him to Bárámúlla whence he had fled to the mountains. 'Alí Sháh sent after him and arrested him and gave him over to keepers. When he fled a second time he was again brought from the Sulaimán mountains. This time 'Alí Sháh took from him his daughter and her dowry of 1,000 ashrafís, and had his daughter divorced from him and caused Khwájah Sará also to leave him and put a watch over him, and at last permitted him to depart to Tibet. 'Alí Rái ruler of Tibet who had an affection for the family of the foolish fellow ran to meet him, and regarded his coming as a great boon and left no rite of hospitality unperformed. He wished him to make the country his own, and begged him to accept his beloved and noble daughter as his wife. He stayed there some time and then at the invitation of Akbar, he took his departure to

India. He arrived in Ágra but died shortly afterwards. (It would be interesting to know what the *ashrafís* which are mentioned in this story, were. The only gold coin I have seen of the Sultáns of Kashmír is one of *Yúsuf*. General Cunningham has two gold coins of Máhárája *Harsha.*)

In 979 A. H. 'Alí Chakk, son of Nauroz Chakk, came to 'Alí Sháh and complained that Dúkah had been trespassing on his estates and interrupting his business. "If you do not stop him" said he "I shall rip open the belly of my own horse." 'Alí Sháh understood this to mean a threat against himself. For this reason he grew angry and ordered him to be arrested and taken to Kamráj. He escaped from this place, however, and fled to Husain Qulí K͟hán, governor of the Panjáb, who did not treat him with conventional hospitality, so he left Lahore and returned to Kashmír where he was arrested by 'Alí Sháh and imprisoned. He again after some time escaped and went to Naushahra where 'Alí Sháh sent an army against him which took him prisoner and hurried him away.

In 980 A. H 'Alí Sháh invaded Khatwár and taking the daughter of the ruler of that place, he returned. At this time Mulla Ishqí and Qází Sadr-ud-Dín came from Akbar on a mission to 'Alí Sháh. 'Alí sent his niece as a wife for the prince Salím, and along with her he sent a quantity of presents. *He also read the khutba and struck coins in the name of that sovereign, i. e, of Akbar.* At this time also Yúsuf the son of 'Alí Sháh on the information of Muhammad Bihut, put to death Ibráhím K͟hán son of G͟házi K͟hán, without the agreement of his father 'Alí Sháh. Yúsuf together with his informer fled to Bárámúlla. 'Alí Sháh tried to heal the wound. People asked that the sin of Yúsuf might be forgiven, but demanded that Muhammad Bihut, who was the cause of the trouble, should be imprisoned which was accordingly done.

In 982 A. H. 'Alí Sháh invaded Khatwár, which is also called Kishtwár. Taking the daughter of the governor of that place for a wife to his grandchild Yaqúb he made peace and returned to the city.

In 983 A. H. 'Alí Sháh together with his family and court visited Jamálnaggarí. Haidar K͟hán, son of Muhammad Sháh, of the family of Zain-ul-Ábidín who was in Gujrát when that country was taken by Akbar, and who returned to India along with the Conqueror, now came to Naushahra. His cousin Salím K͟hán who was in the neighbourhood joined him with a large party. 'Alí Sháh sent a large army under Lauhar Chakk against them. Muhammad K͟hán Chakk, who was then governing Rájáorí being envious at the appointment of Lauhar Chakk imprisoned him and taking his army went over to Haidar K͟hán in Naushahra and offered to conquer Kashmír for him if he could send along with him that brave man Islám K͟hán. Haidar elated with the prospect, allowed Islám to accompany him. When they arrived at the town of Jakún, Muhammad Khán, leaving Islám Khán with an excuse, went straight to 'Alí Sháh and was received with favour. 'Alí Máharí, Dáúd Guzár and others who had sided with Haidar Khán were put in prison.

In 984 A. H. there was a severe famine in Kashmír and many people died of starvation.

In 985 A. H. 'Alí Sháh went out on the top of the mosque and sought the companionship of learned and pious men. And according to the traditions of the Hadíth on the benefits of repentance, he repented and bathed. He spent his time in prayers and in reading the Quran. In his hours of leisure he would mount his horse and engage in polo on the plain. One day as he was on the plain of the ídgáh playing at this game, the pommel of his saddle entered his stomach and he was killed. (For coins of 'Alí Sháh, see Nos. 23, 24, 25, pl. II. One is undoubtedly 987 A. H., and yet the history makes him die in 985. I have one coin of Husain Sháh with date 986 A. H. This is of course quite wrong. For all this I think the coins of 'Alí Sháh are right and the histories wrong. No. 27, pl. II is of Akbar's and is dated 987 A. H. just the same as No. 26 of 'Alí Sháh. This No. 27 I take to be one of the coins struck by 'Alí Sháh in honour of Akbar. There is No. 38, pl. III of the same date 987, and also No. 26, pl. II of Yúsuf Sháh, of the same. We shall have to assign No. 38 to some one.)

Yúsuf Sháh.—When 'Alí Sháh died his brother Abdál Khán Chakk, from fear of his nephew Yúsuf was not present at the mourning, so Yúsuf sent Sayyid Mubáriz Khán and Bábá Khalíl to him with the message that "If you accept me as king, well and good, if not, you had better be king yourself and I will be obedient to you." When they had delivered their message, he said to them, "I am coming and am binding on my girdle, but if any harm happen to me or any hair of mine be injured, the burden be on your own necks." Mubáriz Khán who had evil intentions towards him said, that he would go to Yúsuf Sháh and obtain from him his solemn oath and covenant about this, and with this promise they parted. Mubáriz went to Yúsuf Sháh and told him that Abdál Khán would not come at his invitation, "so it is necessary first of all to cure him and after that to bury 'Alí Sháh." Yúsuf Sháh mounted his horse and went to Abdál, who, opposing him in like manner was slain. Jalál Khán son of Mubáriz Khán was slain in the same encounter. The next day 'Alí Sháh was buried according to the manner of the Shías and Yúsuf Sháh became ruler in his stead.

After two months Mubáriz Khán aided by 'Alí Khán Chakk crossed the river with the intention of rebellion. Muhammad Mákarí, who was leading the van of Yúsuf's army, together with 60 persons was slain. Yúsuf asking for quarter fled to Hírapúr. Mubáriz hearing this news arranged his army and prepared for war. Yúsuf finding himself unequal to the contest fled to the town of Parthál in the jungle. Mubáriz Khán pursued him, and the two parties coming together, Yúsuf took refuge in the mountains, while Mubáriz returned victorious to Kashmír. He imprisoned 'Alí Khán Chakk son of Nauroz Chakk whom he had summoned to his presence to be near him. Other members of the Chakk faction such as Lauhar Chakk, Haidar Chakk and Hastí Chakk from terror did not come to Mubáriz at first, but after awhile they all came, when Bábá Khalíl and Sayyid Barkhurdár had covenanted with them that no harm should happen to them. After this each of them retired to his own home. On their way they made a covenant that they would recall Yúsuf Sháh and make him their king. At once therefore they sent messengers to Yúsuf, saying, that they acknowledged him as king, and were ashamed of their own pusilanimous conduct. Mubáriz began to tremble and promised to go at once with his sons and slaves to Yúsuf Sháh, and with this intention went out of the city accompanied by 'Alí Khán Chakk son of Nauroz Chakk whom he had kept in prison. Daulat Chakk, who was one of his nobles because he had fled before him, was troubled, freeing 'Alí Khán Chakk, he went to the monastery of Bábá Khalíl alone. Haidar Chakk sent a message to 'Alí Khán Chakk telling him that all this exertion and endeavour was to free him. Yúsuf Chakk son of 'Alí Khán said to his father: "Haidar Chakk is explaining his conduct." 'Alí Khán did not heed this, but joined himself to Haidar Chakk and went with him. Lauhar Chakk* and the like of him were gathered together in one place. When they saw 'Alí Khán they took him and put him in prison. After that they all agreed to elevate Lauhar Chakk to the throne. Meanwhile Yúsuf Sháh having arrived at Kálpúr heard that the Kashmíris had made Lauhar Chakk king. (I propose identifying coin No. 38, pl. III as one of Lauhar Chakk's.) The name on it is neither Lauhar nor Gauhar, but some name ending in ع and ud-Dín. Perhaps the name is بدوع الدین Budúa-ud-Dín [the oustripper of others in religion] it is a new name to Kashmír history no matter what it is. (Of course it is the name or title Lauhar Chakk assumed on ascending the throne.) Going from Lálpúr Yúsuf Sháh went to Záhil and taking all his men with him proceeded by way of Jummú to Sayyid Yúsuf Khán Shahídí who was a great noble of the Emperor Jalál-ud-Dín Muhammad Akbar, to ask for help. This noble resided in Lahore. By the assistance of Rája Mán Singh, Yúsuf arrived in Fathpúr Sikrí and had an interview with the Emperor Akbar who had long desired to take Kashmír, and being glad of this opportunity sent Rája Mán Singh and Sayyid Yúsuf Kháu Shahídí to Kashmír, and they started from Fathpúr Sikri in company with Yúsuf Sháh in 987. (This is the date on the coin I read Budúa-ud-Dín or Lauhar Chakk. The next sentence settles the matter I think.) But at this time the kingship of Kashmír was in the hands of Lauhar Chakk. Yúsuf Sháh sent his son Yaqúb before him to wean the people from their own ideas and to sow seeds of dissension in the council of Lauhar Chakk. When Yúsuf arrived in Siálkot he went to Rájáorí and took it and thence to Thatta. At the time Lauhar Chakk sent against him Yúsuf Kashmírí, but the Kashmírí at once joined himself to the king. Yúsuf Sháh being thus helped went by double marches along the most difficult road of Jhúpul to the fort of Sonpúr. Lauhar Chakk along with Haidar Chakk, Shams Chakk and Hastí Chakk marched along the banks of the Jhelum and after a few days a hard battle being fought, victory declared in favour of Yúsuf who then turned his face towards Srínagar. Lauhar Chakk by the intervention of Qází Músá and Muhammad Saádat Bihut, had an interview with Yúsuf Sháh which resulted in his own imprisonment. From amongst the Kashmírís also a goodly number were imprisoned. When Yúsuf Sháh had satisfied himself about the kingship, dividing Kashmír into parts he gave jágírs to Shams Chakk son of Daulat Chakk and to his own son Yaqúb and to Yúsuf Kashmírí, and the rest of the land he let out to tenants in chief. After this, acting on the information of certain people, he put out the eyes of Lauhar Chakk.

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* Written also in MSS. Gauhar.

In 988 A. H. suspicion having fallen on 'Alí Sher Chakk and Muhammad Saádat Bihut and Shams Chakk they were put in prison. Habíb Khán Chakk fled from fear to the town of Khú and Yúsuf, son of 'Alí Khán Chakk who had been imprisoned by Yúsuf Sháh joined Habíb with his four brothers in that place. Thence, going to Tibet, they obtained help from the Rájah and returned, but arriving on the frontiers of Kashmír they quarrelled amongst themselves and did nothing except separate. The soldiery, however, got hold of Yúsuf and Muhammad Khán and cut off their ears and noses. Habíb Khán hid himself in the city.

In 989 A. H. when Jalál-ud-Dín Akbar was returning from Kábul and had encamped at Jalálábád, Mírzá Táhir a relative of Mírzá Sayyid Khán Shahídí and Muhammad Sálih Aqil were sent to Kashmir as ambassadors. When they arrived at Bárapúla, Yúsuf Sháh ran to meet them, and kissing the orders (of Akbar) and putting them on his head, made obeisance and brought the ambassadors into the city. He then sent his son Haidar Khán and Shaikh Yaqúb Kashmírí with many presents to Akbar with whom they stayed for about a year and then returned.

In this same* year Yúsuf Sháh went to Lár. Shams Chakk fled with his chains out of prison and went to Khatwár and joined Haidar Chakk who was at that place. When Yúsuf got to know of this he went after them with an army. They, disagreeing amongst themselves, fled and Yúsuf Sháh returned victorious to Srínagar.

In the year 990* Shams Chakk and Haidar Chakk came from Khatwár to Kashmír with the intention of waging war with Yúsuf Sháh. But Yúsuf met them and appointing his son Yaqúb to lead the van, victory resulted in his favour and he returned victorious. At the intervention of the Rái of Khatwár, Yúsuf forgave Shams Chakk and presented him with a jágír. Haidar Chakk leaving Khatwár went to Rájah Mán Singh.

In the year 992, Yaqúb the son of Yúsuf Sháh was honoured by a reception at the court of Akbar to whom he had gone to give in his submission and homage. When his Majesty arrived in Lahore from Fathpúr Sikrí Yaqúb wrote to his father Yúsuf Sháh that the Emperor was intending to visit Kashmír. Yúsuf said he would meet him. But just at this time he heard that Hakím 'Ali Gíláni had arrived at Thatta on an embassy from Akbar. Yúsuf Sháh at once proceeded to Thatta and put on the robes Akbar had sent as a present. He desired to resort at once to the imperial presence but Bábá Khalíl, Bábá Mahdí and Shams Dadlí agreeing together told him that if he went he would be slain, and his son Yaqúb would transport himself rapidly to Kashmír and get made king. Hearing this, Yúsuf delayed accompanying them, so they returned alone to his Majesty. But when Akbar, who was in earnest about the conquest of Kashmír heard of this device he at once appointed Sháh Rukh Mírzá and Sháh Qulí Khán and Bhagwán Dáss to the invasion of Kashmír. Yúsuf Sháh encamped at Báramúlla. When the news arrived that the invading army had arrived at Haulbás on the frontiers of Kashmír, he stopped up the way. As it was winter and the time for ice and the road was shut up, offers of peace were made. Yúsuf Sháh putting his son Yaqúb on the throne went himself to Rájah Bhagwán Dáss to negotiate. Agreeing to pay annual tribute he made peace. The nobles of Akbar, however, seized him and carried him into the presence of his Majesty. The Emperor was not pleased with the treaty. And in 995 he sent Muhammad Qásim Mírbahr and other nobles. Yaqúb Sháh who was on the throne of Kashmír opposed their coming. The chiefs of Kashmír who were rebellious and who had not given in their submission to Yaqúb, deserted him at this crisis and went over to Muhammad Qásim. Some, however, raised the standard of rebellion in the city. When Yaqúb found that his party was disturbed by internecine quarrels he left the city, and when the army of Akbar entered it he fled to the mountains. Muhammad Qásim having obtained possession of Srínagar extended his power over the provinces. Yaqúb Sháh collecting again an army opposed him. After many Mughals had been slain, Yaqúb was defeated, but after a short time he collected an army with the intention of taking Srínagar. This time Muhammad Qásim not having power to oppose him fled to the fort of Irak and wrote a petition to Akbar asking for aid. The Emperor making Yúsuf Khán Sháhídí governor of Kashmír recalled Muhammad Qásim. When Yúsuf arrived in Kashmír Yaqúb Sháh raised the siege and fled to the mountains. Yúsuf there pursued him for two years. At length he was taken and being encouraged with hopes of the royal mercy he was sent to the Emperor. He was forgiven and the father and son, *i. e.*, Yúsuf Sháh and Yaqúb Sháh becoming nobles of Akbar's court obtained jágírs in the province of Behár. From this time the history of Kashmír is merged in that of the Emperors of Dehlí and the province remained in their power. Before this for a thousand years Kashmír had never been conquered by any one of the kings of India. (Coins No. 26, pl. II, and No. 34, pl. III, are of Yúsuf Sháh. Nos. 35 and 37 are of Yaqúb Sháh. These latter coins are dated 992 A. H. which agrees with the above account. Coins 27, 28, 29, 30 are of Akbar before he had conquered the province. Coins 40, 41, 42 are Akbar's after the conquest of the country. The two latter ones are full rupees. No. 40 is a dám. Srínagar continued to be a mint town of the Mughal Emperors as well as of the Abdállí and Sikh conquerors.)

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* Probably this is 990 A. H. and 990 in the next paragraph should be 991.

The Kings of the Saffáríún Dynasty of Nímroz or Sijistán.—

By MAJOR H. G. RAVERTY.

I have read with some surprise a paper in the Proceedings for April last, p. 75, by Mr. C. J. Rodgers, on some coins from Kandahár, wherein he says :—

"In mixed metal there was a great quantity of the coins of a king but little known to history, *Táj-ud-Dín Muhammad Hardufi* or *Harúfi* or *Kharduфi*, several of one equally little known, *Harb*, and one coin of *Táj-ud-Dín Nasr bin Bahrám Sháh;*" and, that, as some of the coins acquired at the same time bore the names of the "mints Nímroz and Herát, I had no hesitation, as the coins came from Kandahár, in assigning them to kings who at some time or other ruled in South and Western Affghanistan."

This is rather an unsafe theory to go upon, as the result shows. He also regards "the present find as one of some importance especially as the coins reveal altogether a new mint, that of Nímroz." Mr. Rodgers then gives the names of eight kings, which a friend brought to his notice from a work entitled "Tárikh-i-Jadwalia." The names are as follows:—

(1.) Táj-ud-Dín Abul Fazl, son of Táhir.
(2.) Shams-ud-Dín Muhammad.
(3.) Taj-ud-Dín Harb, son of Azzul Mulk
(4.) Bahrám Sháh, Yamín-ud-Dín.
(5.) Nusrat-ud-Dín (6.) Rukn-ud-Dín.
(7.) Shaháb-ud-Dín Muhammad, son of Táj-ud-Dín Harb.
(8.) Táj-ud-Dín."

He adds that he was unable to say anything of the last three until this mention of them was brought to his notice by his friend; then that Minháj-i-Siráj "who uses very strong language indeed about the Mug͟hals," wrote a Tabqa on the Princes of Nímroz. But unfortunately "this Tabqa is not in the abridgement published by the Society to which alone I have access. As the Editor, Major Nassau Lees, says there are but two manuscripts of the works, I am afraid I shall stand but little chance of extending my knowledge." If Mr. Rodgers will refer to the "*Ṭabaḳát-i-Náṣirí*" of Minhaj-ud-Dín-i-Siráj, the whole of which and not "an abridgement," has been translated some years since, he will find that the kings referred to by him are well-known to history, though their names are not all correctly given in the above list. In my "Translation," pp. 183 to 202, will be found not only the *ṭabaḳah* containing the account of the *ten* last kings or rulers of Nímroz or Sijistán,* but also of the preceding eight, and other information respecting this *Ṣaffáríún Dynasty* at pp. 19 to 25, and in several other places. I will here, however, give their names, years of their reigns, and the relationship between them, as the information may be of use to others.

Laiṣ, the head of the Ṣaffár or workers in brass of Sijistán had four sons, Yáḳúb, 'Amrú, 'Alí, and Mu'addil. The first of them who rose to power was—

1. YÁḲÚB, who reigned from 251 H. to 265 H.
2. 'AMRÚ, his brother, from 265 H. to 287 H.

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* Sijistán is the Arabic mode of writing Sigizstán, which is the Tájzík, or native mode, of writing the name. Sistán is used occasionally with reference to the country, and the "city of Sistán" with reference to its capital, but that does not mean that there was any city so called; for Zarang was "the chief city and capital of Sigizstán."

3. ṬÁHIR, son of Muḥammad, son of 'Amrú, from 287 H. to 293 H.

4. LAIṢ, son of 'Alí, brother of Nos. 1 and 2, from 293 H. to 298 H., some say to 299 H.

5. MU'ADDIL, brother of the preceding, from 298 H. to 300 H.

6. 'AMRÚ, son of Ya'ḳúb, son of Muḥammad, son of 'Amrú, No. 2, from 300 H. up to the time he had to surrender his territory to the Sámánís.

7. AḤMAD, by some said to have been the grandson of Ṭáhir, No. 3, but others, that he was the son of Muḥammad, son of Khalaf, son of Abú Jáfar, son of Laiṣ, apparently No. 4, from 309 H. to about 331 H.

8. KHALAF, son of Aḥmad, from about 331 H. to 398 H., who was dethroned by Sulṭán Maḥmúd of Ghaznín in that year; and for a long time Sijistán formed a portion of the Ghaznawí empire. At length, with the support of the Sulṭáns, Alb-Arsalán, and Malik Sháh, between the years 465 H. and 470 H., or thereabouts; for there is no record of the exact date,

9. ṬÁHIR, son of Muḥammad, son of Ṭáhir, son of Khalaf (No. 8), obtained the government of his native country, and ruled to 480 H.

10. MALIK TÁJ-UD-DÍN, ABÚ-L-FATḤ, son of Ṭahir, according to some (but Abú-l-Fazl-i Naṣr, son of Ṭáhir, according to others), who was subject to Sulṭán Sanjar succeeded, and ruled to 559 H., having reigned just eighty years, and was above a hundred when he died.

11. MALIK-US-SÁÍS (THE TORTURER OR CRUEL), SHAMS-UD-DÍN MUḤAMMAD, son of Táj-ud-Dín, from 559 H. The length of his reign is uncertain, but is said to have extended over a considerable time; and, at length he was put to death through his tyranny.

12. MALIK-US-SA'ÍD, TÁJ-UD-DÍN-I-ḤARAB, son of Muḥammad, who, by some, is styled Táj-ud-Dín, Ḥasan, son of 'Izz-ul-Mulúk and Táj-ud-Dín-i-Ḥarab, son of 'Izz-ul-Mulk, by others, who must have been the brother of No. 11, as No. 12 is called his nephew. He died at the age of one hundred and twenty in 612 H., after a reign of sixty (fifty ?) years. He was the vassal of the Sulṭán of Ghur.

13. MALIK NÁṢIR-UD-DÍN, 'UṢMÁN-I-ḤARAB, son of the preceding, but, as he only acted as his father's representative, on account of the latter's great age and total blindness, other chroniclers than Minháj-ud-Dín do not mention him as a separate ruler.

14. MALIK-UL-GHÁZÍ, YAMÍN-UD-DAULAH WA UD-DÍN, BAHRÁM SHÁH son of Táj-ud-Dín, brother of the preceding. He was a vassal of the Khwárazm Shah, and the most illustrious of the later rulers of Sijistán. He reigned from 612 H. to 618 H., when he was assassinated by the Muláḥidahs of the Kuhistán.

15. MALIK NUṢRAT-UD-DÍN [Muḥammad ?], son of the preceding

ruled from 618 H. for a few months, when his elder brother, Rukn-ud-Dín Maḥmúd, who had been kept in confinement by his father for some time, on account of his misconduct and cruel disposition (see p. 198), was set at liberty by the above-mentioned heretics, defeated Nuṣrat-ud-Dín Muḥammad in battle, and assumed the sovereignty over Nímroz or Sijistán.

16. MALIK RUKN-UD-DÍN MAḤMÚD, son of Bahrám Sháh from 618 H. His cruelty and tyranny was such that the people recalled his brother, the Amír, Nuṣrat-ud-Dín Muḥammad; and while the brothers were contending, an army of Mug͟hal infidels, suddenly and unexpectedly reached Sijistán, and appeared before the capital, which was taken, its people butchered, the city desolated, and the country depopulated. This is one of the reasons why the author of the Ṭabaḳát-i-Náṣirí "uses very strong language indeed" against the Mug͟hals. In the massacre above referred to the two brothers perished. After the Mug͟hals disappeared from the country, a son of Malik Náṣir-ud-Din, 'Us̤mán (No. 13), brother of Bahrám S͟háh, named S͟hiháb-ud-Dín Maḥmúd, who had been in concealment, came forth, and assumed authority.

17. MALIK SHIHÁB-UD-DÍN MAḤMÚD-I-ḤARAB. He did not acquire much power; for the country was in a state of desolation, and the people few. The Muláḥidah heretics induced S͟háh 'Us̤mán, a grandson of Náṣir-ud-Dín, 'Us̤mán (No. 13), to come from Neh and occupy Sijistán. He asked for aid from the Malik of Kírmán the governor on the part of the K͟hwárazm Sháh, Buráḳ, the chamberlain, a Ḳará K͟hiṭá-í-Musalmán, the same who afterwards murdered his sovereign, and sent his head to the Mug͟hals, whose feudatory he became; and he was the founder of the Ḳará-K͟hiṭá-í dynasty of Kirmán. The K͟hwárazmí forces having arrived from Kirmán and joined 'Us̤mán, Shiháb-ud-Dín Maḥmúd was martyred, and his brother, the Amír, 'Alí, the Záhid or Recluse was set up, but his government acquired no stability, and he died. He is not accounted among the rulers of Sijistán or Nímroz; and with these the dynasty of the Ṣaffáríáns terminated.

18. MALIK TÁJ-UD-DÍN, BINÁL-TIGÍN, THE K͟HWÁRAZMÍ. He was the commander of the troops sent from Kirmán, and was of the family of K͟hwárazm Sháh. He took possession of the territory for himself in 622 H., or the following year. In the year 625 H., an army of Mug͟hals again entered the territory of Nímroz, and invested Táj-ud-Dín Binál-Tigín, within the fortress of Uk of Sijistán.* He defended it for nineteen months; but one day, in going round the walls, received an arrow from the Mug͟hals in one of his eyes; and, subsequently, by accident, fell from the battlements to the ground, and was taken prisoner.† The

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* See "Translation," p. 1120.

† *Ibid*, pp. 1125, 1126.

[illegible]ess was captured and all within massacred; and Táj-ud-Dín, Binál Tigín was taken from Sijistán, and put to death by the infidels at the foot of the walls of the fortress of Ṣafed-Koh.[*] and thus terminated the dynasty of the rulers of Nímroz or Sijistán at the close of the year 628 H

These kings, whose mint was Nímroz or Sijistán, had nothing whatever to do with either Hirát or "West" or "South Affghanistán," the Mughals or their vassals held Hirát and its territory, as well as Kábul and Ghaznín, and their dependencies, there was no place then known as Ḳandahár, but its territory was known as Bál-yús, or with 'w,' that letter and 'b' being interchangeable, Wál-yús, "Afghánistán," then, as now, does not refer to either Hirát, Kábul, Ghaznín, or Kandahár, but to the vast mountain tract surrounded on all sides by the stupendous range of Mihtar Sulaimán or Koh-i-Siyah, and also known under the designation, but in a somewhat extended sense in more recent times, of Roh There is a great difference between "Afghánistán," and the Afghán State, to which the name Afghánistán has of late years been loosely applied by Europeans only.

Mr Rodgers appears surprised at "Mangú Khán" the Mughal, putting "the Khalífah's name on his coins" It would be surprising if *he did*, but the Mughals at this period had no coins but the *balish*, which will be found explained in the translated text The way it happened that the Khalífah's name appeared is, that the subject Musalmán Princes had to insert the Mughal name somewhere, but they left the other side of the coin as they would have done if a Musalmán was their suzerain, and the Mughals had never existed This is shown from the coins of the rulers of Kirmán, and of the Kailúgh Turks of Ghaznín and Karmán, and others, who, whether they liked it or not, had to submit to fate, and insert the name of an infidel Mughal on one side of their money

Mangú Ḳá'án *is said* to have repeated the *kalimah*, but he was no Musalmán, and was buried according to the prescribed rites of the Mughals, and was interred at the side of Chingiz Khán, and of Túlúe or Túlí, his father[†] If he had been a Musalmán, how came it about that he despatched his brother, Hulákú, to destroy and extirpate the 'Abbásís? and overturn the Khiláfat, which he did, and destroyed every male, as he supposed, of the Khalífah's race?

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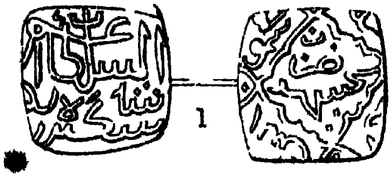
[*] *Ibid*, pp 1181, 1197 to 1205

[†] *Ibid*, p 1181, and rule 3, p. 1223, and note to p 1228, para 4.

PLATE I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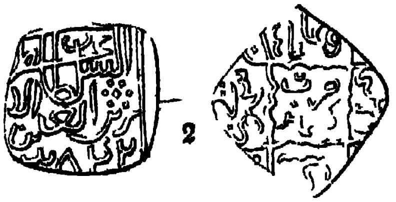
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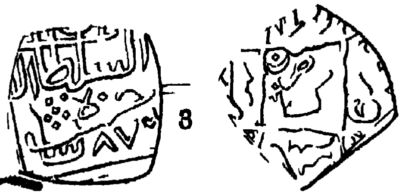
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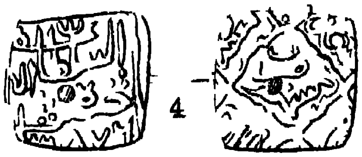
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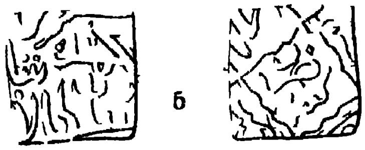
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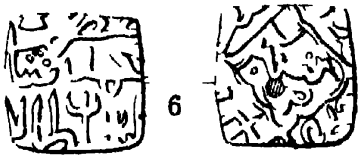
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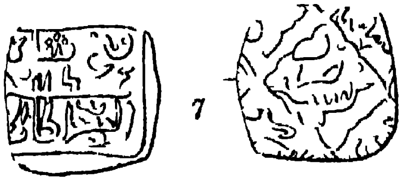
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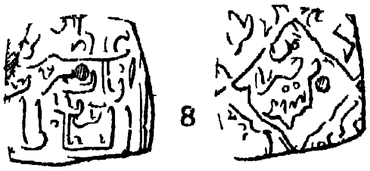
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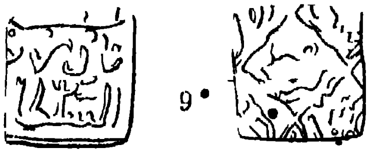
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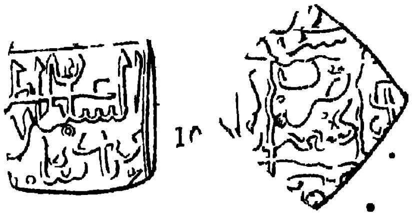
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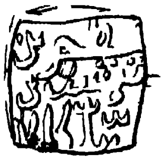
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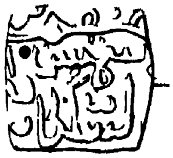
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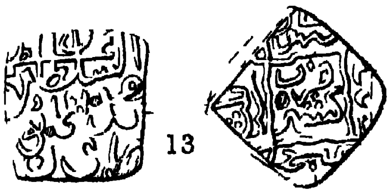
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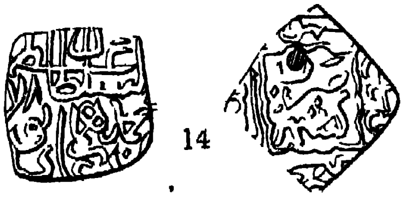
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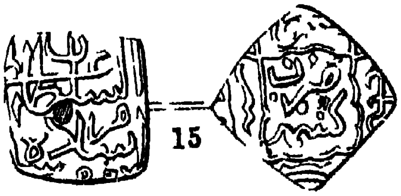
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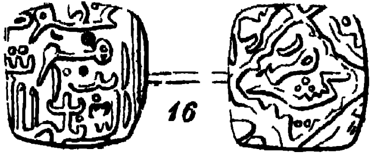
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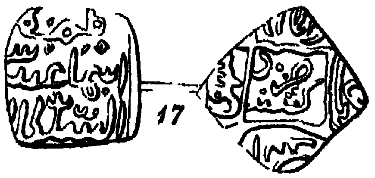
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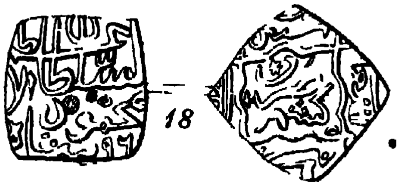
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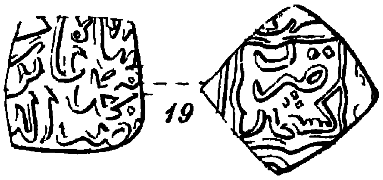
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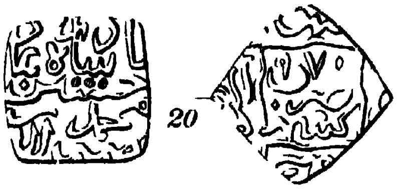
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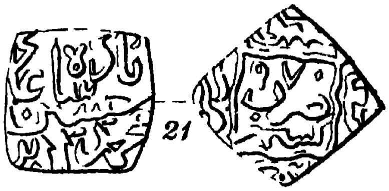
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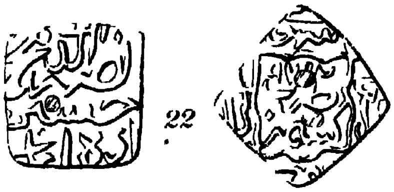
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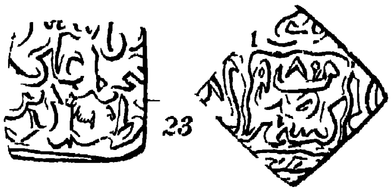
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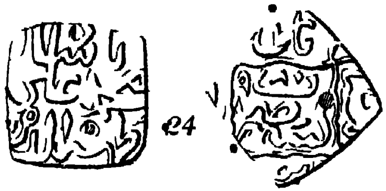
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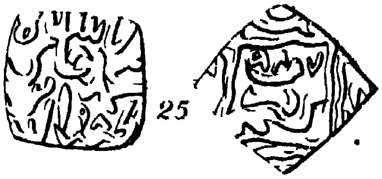
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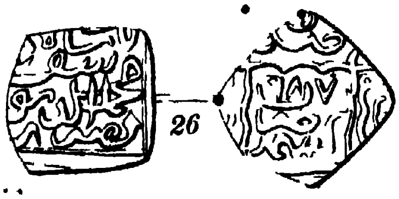
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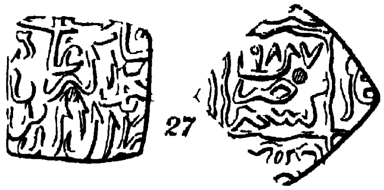
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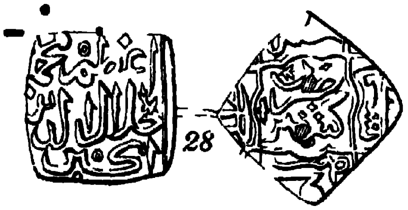
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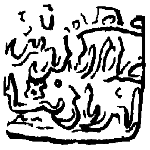
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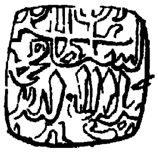
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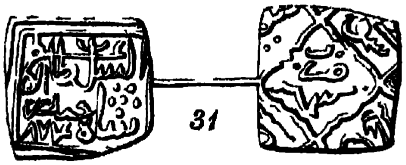
PLATE III.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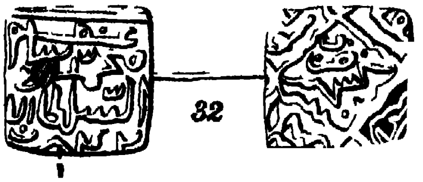
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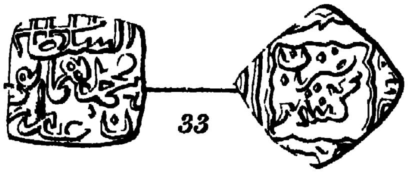
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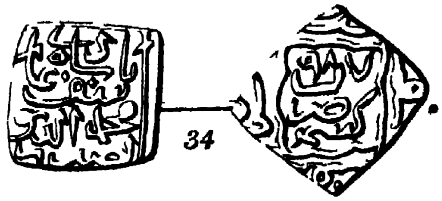
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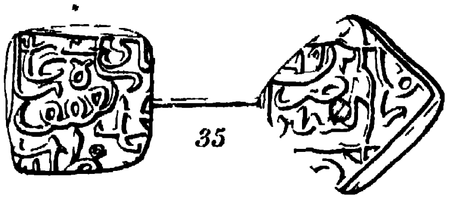
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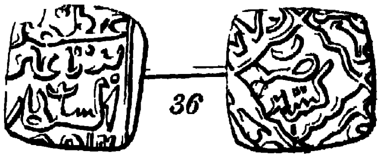
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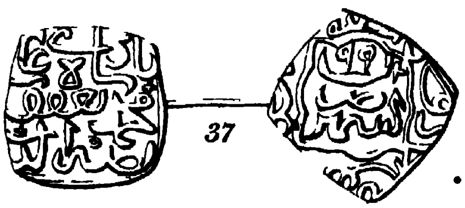
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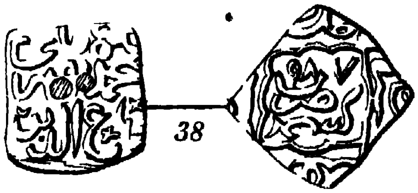
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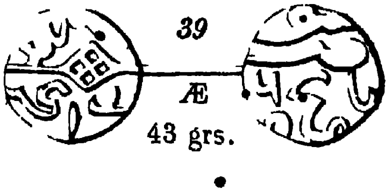
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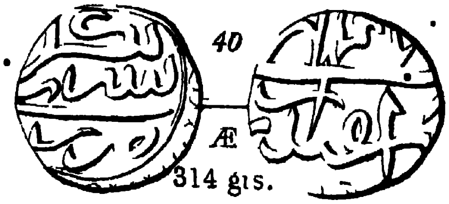
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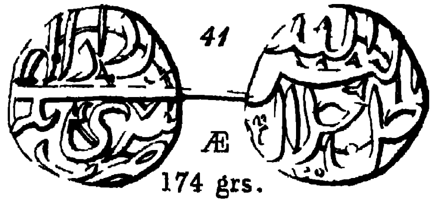
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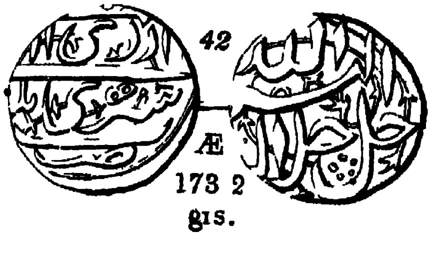
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C J Rodgers del

SILVER COINS OF THE SULTĀNS OF KASHMĪR

JOURNAL

OF THE

ASIATIC SOCIETY OF BENGAL.

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Part I.—HISTORY, LITERATURE, &c.

Nos. III & IV.—1885.

Notes on the Fatehpur District. N. W. P.—By F. S. Growse, C. I. E.

(With a Plate.)

In order to distinguish it from other places bearing the same name —which is an extremely common one in the N. W. P.—the capital of the Fatehpur District is very frequently designated Fatehpur-Haswa. The latter member of the compound is the name of a small decayed town,* about 7 miles distant, which is now of no importance whatever; but is traditionally represented as the oldest inhabited site in the neighbourhood. Its eponymous founder is said to have been a Rájá Hans-dhvaj, whose two brothers, Mor-dhvaj and Sankh-dhvaj, are also locally commemorated by the names of two adjoining villages, Moráun and Sankháun. The Rájá's second son, Ran-bijay, had the hardihood to capture the horse that had been turned loose by the Pándavs, after their great sacrifice at Hastinapur; and they, taking this as a challenge, at once came down upon him and slew both him and his elder brother, Siva-dharna.† On their death, their sister Champávatí inherited the throne. She is said to have re-named the town after herself, Champaka-purí, and dying childless, to have bequeathed it to Bráhmans, whose descendants held it for many generations.

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* Gen. Cunningham *sub verbo* in Vol. XVII of the Archæological Survey gives it a population of about 10,000, which is very much over the mark. The return by the last census was 4,197 only.

† This name is doubtful. It is also given as Sudhanwa, or Surat.

However this may be, and, so far as I am aware, there is no authority in the Mahábhárat for the above legend, the town, when it again reappears in local history, is still styled Haswa and its Rájá bears the cognate name of Hans-ráj. After the defeat of Jay Chand, of Kanauj, and his brother Mánik, near Karra (in the Allahabad district near the Fatehpur border) Kutb-ud-dín with his two sister's sons, Kásim and 'Alá-ud-dín, is stated to have advanced against Haswa. Hansráj came out to meet them, and joining in single combat with 'Alá-ud-dín at a village called Chakheri, there lost his life. 'Alá-ud-dín also lost his head, but the headless trunk fought its way on to Haswa, a distance of 12 miles. His *dargáh*, on the top of the old Fort in the centre of the town, is still held in much veneration, and is said to mark the spot where at last he fell and was buried.

At the present day the town of Haswa is almost entirely surrounded by a broad shallow sheet of water. This has been deepened at one end and brought into more regular shape as a tank, in the centre of which is an island, measuring 165 feet square and faced on all four sides with flights of masonry steps. It is approached from the town by a bridge 150 feet long, consisting of 15 arches, of which 7 are open and 8 closed. Its construction is ascribed to a Kázi Yákúb, who, it is said, was afterwards put to death by the Emperor Akbar, and that the circumstances are related in the *Zuhúr-i-kutbí*. This is a book with which I have no acquaintance; but I find it recorded by Badáoni that Kázi Yákúb was suspended by the Emperor, his offence being that he had maintained it was illegal for a Muhammadan to marry more than four wives, as Akbar had done.

In the century immediately preceding the Muhammadan conquest, the Fatehpur District would seem to have been exceptionally rich in temples of the same style as those that still commemorate the power of the Chandel dynasty in Bundelkhand, across the Jamuná, at their ancient capitals of Mahoba and Khajuráo. But, on this side of the river, those that were built of what is generally supposed to be the more durable material, stone, have all been destroyed, and nothing of them now remains *in situ* beyond their foundations. The sculptured superstructure has been razed to the ground, and the fragments either buried on the spot or dispersed in the neighbouring villages, where they may be seen lying about in the lanes, or built up into the walls of the houses and modern temples.

The only two specimens of the style still left standing are both of brick; one at Tinduli, near the busy market-town of Bindki, on the road to the Mauhár Railway Station; which is shown in the accompanying photograph (Plate VI); the other at Bahua, a few miles from the Chilla Tára Ghát across the Jamuná, on the road from Fatehpur to Bánda.*

The wonder that both these temples should have survived the rough treatment of so many centuries is increased by the fact that they have been simply set flat upon the plain without any foundations, and that no mortar has been used in any part of the construction, but only clay. The bricks, however, are not only of excellent quality, but are so clean cut and so well joined, that—but for actual violence—it is probable that the building would have stood uninjured to the present day. The moulded devices that form the surface decoration of the tower are of a simple and perfectly inoffensive character; but the porch, which was of stone, was covered with figure sculptures. This would seem to have provoked the wrath of some Muhammadan iconoclast; and, in a style of construction where the mutual interdependence of all the parts is so close, its destruction involved much damage to the remainder of the fabric.

About 100 years ago, the Tinduli temple was patched up by a Bráhman from the next village, who added the present porch and also restored with plain unmoulded bricks a considerable portion of the tower. Some of this new work has again given way; the plinth was also much broken, and unless the progress of decay had been quickly arrested, in the course of another year or two the whole building would have become a complete wreck. A small grant has therefore been made me by the Local Government, and out of this I have had the terrace re-made and on the east side strengthened with a masonry wall, in the centre of which I have introduced a recessed flight of 9 steps leading up to the level of the temple floor. The whole of the plinth also has been carefully restored all round up to the height where the ornamental work begins. This, it is hoped, will so secure the building as to prevent any further fall of the superstructure. The two or three fragments that remain of the sculptured doorway have been let into the front of the modern porch; which, if not ornamental, is at least useful as a buttress. As a necessary precaution against the future criticism of any anti-restoration fanatic, I have had two photos taken as unimpeachable evidence of the actual condition of the temple before the repairs were commenced. The shrine is at present occupied by a statue of Chatur-bhuj, after whom it is named; and it is possible that this may have been its original dedication. The village is inhabited by a comparatively recent colony of Kachhwáha Thákurs, and there is no local tradition as to the founder.

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* Neither of these temples receives the slightest mention in the new Gazetteer of the Fatehpur District.

The building at Bahua is smaller, plainer, and in a much more ruinous condition. It must originally have been dedicated to Mahádeva; but at present it contains a recumbent statue of Náráyan with Lakshmi at his feet and Brahmá seated on a lotus growing out of his navel. The figure is set upright against the wall, and locally is known only by the name of Kakora Bába, to whom offerings are specially made by young wives, natives of the village, after the birth of their first child. Some 200 years ago, probably at the time when the new patron was installed, the temple which must then have been quite a ruin, was very ignorantly repaired, pieces of the sculptured doorway (which—as at Tinduli—had been thrown down) being built up into the roof and other places to which they did not belong. These I have taken out and joined together on the ground, and it now only remains to set them up in their proper position. This can be done at slight expense, with the help of two iron girders to support the broken architraves, and by building up a flight of masonry steps underneath. The plinth also is being repaired, and the ground raised, levelled and inclosed, to prevent injury from cattle. In both temples the *cella* under the brick *sikhara* is entirely of stone, with a flat cieling, above which the hollow brick shaft closely resembles in appearance the interior of an old-fashioned English chimney.

Other interesting remains of the Hindu period exist at Asothar and Hathgánw. The former town is the seat of a Rájá, who in the absence of any rivals, ranks as a person of some local distinction, though his estate consists of six villages only. All the other resident gentry in the district are Muhammadans, whose ancestors were mostly officials of the Lucknow Court, and who are now reduced to poverty. He belongs to the Khichar clan, which is recognised as a branch of the Chauháns, and had its original home at Khichidára, or Raghu-garh, in Central India. It was from there that one Deogaj Siñh came about the middle of the sixteenth century A. D. and had the good fortune to marry a daughter of the Gautam Rájá of Aijhi, now a small village, a few miles from Asothar. The descendants of this marriage, however, achieved no distinction of any kind, till 150 years later, when a member of the family, by name Aráru Siñh, discovered, as is said, a hidden treasure. Certainly by some means or other he contrived to secure for himself a more prominent position than that of any other Hindu in the neighbourhood: but it lasted only a very brief period.

The Asothar Fort was built by Aráru Siñh and is therefore of no antiquity; the town is many centuries older. Its original site is indicated by an extensive brick-strewn mound, two or three furlongs to the south of the Fort. On the highest part of it is a small enclosure of recent construction, which bears the name of the eponymous hero, Asvatthámá, the son of Drona, though it would seem rather to have been the site of an old temple of Mahádeva. Part of the stone sikhara has been set up as a lingam; the gurgoyled water-spout makes a trough for a well; and many other sculptured fragments are either lying about, or have been built up into walls; all being apparently of the 9th or 10th century. On a small mound further to the south are five large figure-sculptures. All are nude; one is standing, the others are seated, cross-legged, with the usual accessories of lions, elephants and devotees. The hair of the head is in short close curls, as in statues of Buddha; but the nudity is more a Jaini characteristic. The people call them the five Pándus, which is the popular name in all parts of India for any five sculptures of doubtful significance.

At Hathgánw the centre of the town is occupied by a considerable mound, the site of an old fort. Here stands a ruinous mosque, constructed from the wreck of two or more Hindu temples, like the better-known Assi Khamba at Mahában in the Mathurá district and the so-called Parmál's Palace at Mahoba. It is popularly known as the Háthi-Khána, or elephant stable, with reference to the legendary animal from whom the town is supposed to derive its name. This had been given by Rájá Jay Chand of Kanauj to a local saint, called Parásur Rishi, with a promise of a grant of all the land that the elephant walked over without stopping to rest. To prevent any future dispute as to the exact limit of its walk, it no sooner lay down than it was there and then turned into stone, and a fragment of the image still remains about two miles from the town, where an annual fair is held in its honour. The ruins consist of 23 pillars still standing, arranged in four aisles of 6 columns each, with a masonry wall at the back and sides. Apparently there was a fifth aisle, but if so, the whole of it has disappeared. The temple-doorway, a handsome piece of sculpture, has been set up by itself as the entrance to the mosque enclosure. The date of the columns is not later than the 10th century; their present arrangement was probably carried out by the Sultán of Jaunpur in the 15th or 16th century.

In the District Gazetteer, published by the Local Government in 1884, these interesting relics are briefly and incorrectly noticed as follows: "There was a fort in the time of Rájá Jay Chand, but only the foundations of it remain." At Khakhreru, which since 1852 has been the head-quarters of a Tahsili, the same authority notes with similar inaccuracy, "there was a fort here, of which only the ruins now remain." A small mound by the side of the main road to Khága is, it is true, locally called the Garhi, or Fort, but it is clearly only the site of a temple. This was thrown down by the Muhammadans, who used the materials to construct a grave-yard and mosque. In 1852 it may be presumed that these latter buildings had apparently fallen into ruin and the bricks were then used, for a third time, in the construction of the new Tahsíli. All the carved stones, however, were left on the spot. These consist chiefly of architraves and door-jambs, handsomely carved in the style of the 10th century. A fair is held here at the end of Bhádon.

At Khairai, 5 miles from Khága on the road to Dháta, is a circular mound adjoining the village, which also must have been the site of a temple. Only the foundations remain *in situ*, together with traces of a broad flight of steps leading up from the level of the plain below. Several huge broken blocks of sandstone are lying about, possibly the fragments of a colossal lingam; and, in the village, let into the wall of a small modern shrine and in other places, are some mutilated figures and architectural details. In an extensive mound a little to the east, called the Gaṛhi, I dug up three spirelets of a *sikhara*, each 3½ feet high, covered with the ornamentation characteristic of the 10th century A. D. From the time of Alá-ud-dín this village has been almost exclusively inhabited by Muhammadans.

The Gazetteer, as will have been observed, has adopted the native practice of styling any ruin a *Gaṛhi*, or Fort, but it entirely omits to mention the remains of what would seem to have been the most considerable of all the old Hindu forts in the district. This is at the village of Paina, about a mile north of the Gházipur Tahsíl. The circuit of the wall with its gates and towers can be distinctly traced, and in the centre of the high broken ground which it encloses, is an inner citadel, further protected by a broad and deep moat. This fortified town is said to have been originally a stronghold of the Chandels, and may very probably be of still higher antiquity, but nothing is known of its history. The citadel was built, or rebuilt, by Aráru Siñh of Asothar, who probably gave it the name of Fatehgarh, by which it is now known.

Specimens of late Muhammadan architecture may be seen at the town of Khajuha, between four and five miles from the Tinduli temple. They form part of an extensive series of buildings erected by the Emperor Aurangzeb, to commemorate a victory over his brother Shuja in a battle that was fought in the neighbourhood in the year 1659. He took up as much as 223 acres of ground for his new works, which comprise a large walled garden, called the Bádsháhi Bágh; a masonry tank, with an area of 14 acres; and a fort-like saráe, with two lofty gates. There is now, except during the rainy season, very little water in the tank; for large portions of the wall that enclosed it have fallen, and so much earth has been washed in through the breaches, that the bottom of the basin is little below the level of the adjoining fields and is mostly under cultivation. The garden has a lofty main entrance in the same style as the sarae gates, and an elegant smaller portal, which once opened on to the street, but is now blocked by a Post Office on the 'standard plan,' which has lately been built immediately in front of it. The garden walls have domed turrets at the corners; in other huge towers there are wells, with cool vaulted cells, and above them cisterns to supply water both for a cascade that forms the back ground of a shady alcove and for the fountains that played in three reservoirs of cut stone set in the different terraces. The Great Terrace runs the whole length of the tank and has its centre raised yet another stage, which is approached from the lower grounds through graceful stone arches with broad double flights of steps. Upon this upper stage are placed two Pavilions. One is maintained in repair, having been converted into a road-inspection house, though unfortunately it was not a little spoilt in the process; the other, it is hoped, will now be cleaned up and henceforth kept in decent order, without any utilitarian alterations or additions. Constructurally it is quite sound.

The Saráe has as many as 130 sets of vaulted rooms, three of which have been thrown into one to serve for a school, the rest are let out for the accommodation of travellers. In the centre of the square, which has an area of 10 acres, there is a domed mosque, and outside the gate are massive ranges of stabling for horses and elephants. The design of these memorial works is on a grand scale of Imperial magnificence, but the execution was probably hasty and there is not much delicacy in any of the details. The total outlay must have amounted to a very large sum.

Another building which dates from the same long reign but from the very end of it and is therefore about half a century later, marks a further decline in architectural skill. This is the tomb of Nawáb Abd-us Samad, who was a person of importance in the Imperial Court, and, enjoyed very extensive grants of land both in the Doáb and in Bundelkhand. At Mutaur near the Jamuná in the Gházipur Tahsíl of the Fatehpur district he built a Fort and a fine tank (which I have not yet seen) but his principal residence appears to have been in the town of Fatehpur itself, which he extended by the addition of a new muhalla, called Abu-nagar, after his eldest son Abu Muhammad. The tomb stands in extensive and well-wooded park-like grounds that were attached to the house and has stone arcades and traceried windows and must have cost a large sum of money. But it is a heavy, ill-designed structure and would seem to have been hastily finished after the premature death of the founder's eldest son. The stone kiosques which surmount the four corners would have been pleasant places to sit in and look out upon the garden, but there is no possibility of getting up to them, as no staircase has been provided. This oversight may have been the result of haste at the end, but the original design is curiously faulty in making these small cupolas exactly the same height as the large central dome; an arrangement which produces a very flat, cumbrous effect. There are two incriptions, which read as follows:

الله اکبر

* عین‌الذسان جان‌جان عبدالصمد خان درجهان *
گوئ فتوت برو ز ابنائ زمان *
* طائر روحش چودل برداشت زین دنیائ دون *
* برفراز عرش رفت و گشت فردوس آشیان *
* خامهٔ تقدیر بر لوح ازل کرده رقم *
* کشف سال هجرتش از غم الم بر دوستان *

الله اکبر

غفران پناه ابو محمد ولد عبدالصمد خان روشنانی نوزدهم شعبان سنه هجري مطابق سنه ۴۸ جلوسی درعهد خلد مکان او رنگ زیب بادشاه غازي بعمر بست و سه سال ازین جهان گذران بگلگشت جنت شتافت و تعمیر مقره در سنه ۱۱۴۱ هجری ترتیب یافت *

Translation.

I. The paragon of mankind, the soul of souls, Abd-us-Samad Khán, having vanquished all the men of his time in the field of gallantry,

His soul, like a bird, resolved to sever its connection with this miserable world, and flew away and made heaven its rest.

The date of his departure can be calculated for his friends from the words *gham alam* (grief and sorrow) which the pen of fate inscribed on the tablet of *eternity.*

The letters in *gham alam* give the date 1111 (Hijri) thus: *gh* = 1000; *m* 40; *a*, 1; *l* 30; and *m* again 40: total 1111.

II. God is great. The asylum of forgiveness, Abu Muhammad, son of Abd-us-Samad Khán, Roshanáni, on the 19 Shabán, in the year 1116 Hijri, corresponding to the. 48th year of the reign of the late Emperor Aurangzeb, at the age of 23, departed this life and migrated to heaven. The tomb was finished in the year 1121 Hijri.

The grounds contained a large masonry tank and ornamental pavilions, but these with the house itself were all dismantled only four or five years ago by some credulous persons, who hoped to discover a hidden treasure. Nothing of the kind was found, and the price of the bricks and other materials, which were sold to a railway contractor, can scarcely have done more than cover the cost of demolition. The Gateway alone is now left standing, a massive brick building, but in the same plain and clumsy style as the tomb.

The principal memorial of the connection of the district with the Lucknow Court, during the latter half of the 18th century, is to be seen at Kora, where is a fine masonry tank constructed in a year of famine by Zain-ul-abu-d-dín the local Governor, under the orders of the Vazír Mír Almás 'Alí Khán. It has a handsome pavilion on its margin and across the road is a large walled garden, in two courts, with a high gateway between them, and at the far end a lofty double-storeyed building, in the grandiose style of the period, of good proportions, but without much delicacy of detail. The piers of the arcades are enormously massive, but there are terrible cracks in the walls, probably arising from an unequal settlement of the foundations, in consequence of the excessive mass of the superstructure. Tank, garden and pavilions were all bestowed in gift upon a Káyaṭh, Manná Lál *alias* Rám Prasád, who on becoming a Muhammadan, took the name of Haidar Bakhsh and had the title of Nasír-ul-Mulk conferred upon him by Nawáb Asaf-ud-daula. As he died childless, the property passed to the family of his brother, who had remained a Hindu, and is now owned by Ikbál Bahádur, son of Ráo Lál Bahádur, who distinguished himself by his loyalty in the mutiny. He built a temple of Sítá Rám on the margin of the tank; but attached to his private dwelling-house are the mosque and *imámbára* of his relative, the original donee, which he keeps in repair for public use, though they strike a visitor as rather curious appendages to a Hindu establishment.

About the same time as the tank, a long and substantial bridge was built over the Rind, the only one by which that river is crossed, just outside the town of Korá and immediately under the walls of the old Fort. In the Gazetteer it is incorrectly described as "a fine old Mughal bridge:" it is really due to a baniya, named Fatih Chand. The older Muhammadan bridge, of which the abutments remain, a hundred yards or so higher up the stream, was a very much smaller structure, apparently intended only as a private approach to the Fort.

Zain-ul-abu-d-dín's government is further commemorated by the town of Jafarganj, which he named after his son Jafar 'Alí Khán. Here he settled some artisans whom he brought from Lucknow, and the three grandsons of one of them still carry on what is the most notable art-manufacture in this district. Their business is that of cotton-printers, and the peculiarity of their work is that only the simpler part of the pattern is stamped, while all the finer portions are hand-painted. Bed-covers, awnings for tents and a variety of small articles for native use are what they have hitherto been in the habit of making; but they have now made me some curtains, which are very handsome and effective, and would certainly command a large sale in the European market.

In 1801, when this part of the Doáb was included in British territory, Nawáb Zain-ul-abu-d-dín's eldest son, Bákir ’Alí Khán, was retained as farmer of the district under the new administration. He added a new quarter to the town Fatehpur, called after his name Bákir-ganj, and here stands his tomb built about 1815 A. D. with a mosque and other accessories. It is a group of no great architectural merit: but being surrounded by a small flower-garden and occupying a conspicuous position at the junction of four main thoroughfares, it forms the only picturesque feature in a singularly mean and unattractive town.

Since then, no Muhammadan has been in a position to spend any money upon building. But a great number of Hindu temples have arisen, some of which are interesting specimens of modern native architecture, especially two situated in the outskirts of the town of Khajuhá. One of these has a quasi-Muhammadan dome, the other a high spire with clustering spirelets in the old Hindu fashion, and the façade of each is reflected in the water of a large and well-filled masonry tank. Both were built about fifty years ago by rich local traders.

To any one like myself coming from such a thoroughly Muhammadanized district as Bulandshahr, the multitude of Hindu temples all over this part of the country is a very striking novelty in the landscape. For the most part they are small brick buildings with plaster arcading to ornament the walls, and are surmounted by domes more frequently than orthodox Hindu spires. There is considerable monotony in the design; but seen through the foliage of the mango and *mahua* groves with which the district abounds, they are graceful and picturesque objects, and one or more of them is visible from almost every single point of view in the neighbourhood of a village or along a main thoroughfare. Frequently the shrine is built in connection with a large masonry tank, a great boon to the wayfarer in such a thirsty land. The two temples above-mentioned are on a larger scale than usual, but are typical as regards treatment. In both the general effect is pleasing, and in the domed example the elaborate painted decoration is somewhat exceptionally artistic. In the other temple the details of the spire are clumsy, but considerable taste has been shown in the general grouping.

Fatehpur is invariably described—even in its own Gazetteer—as a district that contains nothing of the slightest archæological or artistic value. My notes, brief and incomplete as they are, suffice to show that it has been maligned. In fact I believe there i scarcely a district in India about which such a remark could be mad with truth, though it is popularly stated with regard to many. Gi en a slight faculty of observation, every part of the country will be ound to abound with interest, not only as regards relics of the pas but also in indications of still existent powers and capabilities.

Two classes of the community are deserving of special notice; 1st, the Singraurs, for their singularity; and 2ndly, the Gautam Ṭhákurs, for their number and importance. The Singraurs are not mentioned by name in any book that I have seen; not even in the local Gazetteer, where the people, who so style themselves, are included under the generic designation of Lodhas. Of this tribe they may be an offshoot, but they differ in many respects from the common stock. They are found only in the Ekdalá, Khágá and Khakhrerú Tahsíls, where they form almost the entire population of several villages and own a considerable quantity of land. As a corruption of the Sanskrit Sringavera, Singraur is the modern name of the Gháṭ, in the Nawáb-ganj Pargana of the Allahabad district, where (as is told in the Rámáyaṇa) Ráma, Sítá and Lakshman were ferried across the Ganges by the Nishád chief Guha. Not only is there this identity of name, but the tribal designation Lodha (which is for *lubdhika*) is a fair equivalent in meaning to the classical Nishád. Some traditional connection between the people called Singraur and the place Singraur might therefore naturally be expected; but so far as I could ascertain, none such exists. All the Singraurs of Ekdalá bear the title of Ráwat, which was conferred upon them by the Emperor Akbar, after a visit to that town, in which he was attended by his famous minister, Bírbal, whose mother's sister lived there. All they could tell me as to their origin was that they came, in the time of the Pomárs, from the neighbourhood of Bánda, south of the Jamuná; which is in exactly the opposite direction from the Singraur Gháṭ, on the Ganges, which is to the north.

According to a very widely accepted tradition, the Gautam Thákurs once owned the whole of the present Fatehpur district, together, with much adjoining territory on both sides of the Ganges. They claim descent from the Vedic saint Gotama, who is also the reputed ancestor of the Sakya tribe, of whom sprung the great Buddha; whence, in many countries where his religion flourishes, he is popularly known by his patronymic, Gautama. The Gautam Rája had his principal seat at Argal, a small secluded village in the Kora Pargana, buried in the ravines of the river Rind. Possibly the old Fort was so named as forming a natural 'bar,' or barrier (which is the meaning of the Sanskrit *argala*) against the approach of an invader. Similarly, Rind or Arind, the name of the river, is a contraction for Arindama, 'the subduer of enemies,' which would seem to refer not so much to the depth of the stream as to the inaccessibility of its broken banks. The power of the family and the extent of its territory may have been greatly exaggerated, and certainly no external evidence of the truth of the local tradition has yet been supplied either by coins, or copper-plate inscriptions, as for the Gupta and Gaharwár dynasties, nor in temples of well-ascertained Gautam foundation, such as attest the wealth and magnificence of the Chandels. Neither do the Muhammadan chronographers make much mention of the long struggle against the Imperial forces to which the Argal Rája attributes the total disappearance of all his family records. So far also as I am aware, there are no extensive ruins at Argal, such as might be expected at a place which for many centuries was the capital of an independent principality. But on this point I cannot speak from personal knowledge, as I have never visited the spot. Not only is it far off the beaten track, but the Rája dislikes being seen by Europeans, as his personal surroundings are simply those of a small yeoman, and a visit dictated chiefly by curiosity might be regarded as an intrusion. To such extreme indigence is he now reduced, that his eldest son, and consequently the heir to one of the oldest titles in India, is now a Constable in the Hamírpur Police on a salary of Rs. 10 a month, and without much prospect of promotion, on account of his imperfect education. The second son has been given a small scholarship for his support, and is a pupil in the Government school in the town of Fatehpur, but though 15 years of age, he is only in the 9th class; and thus there is little prospect of any revival of the family fortunes in this generation.

As a set off to the want of material corroboration for the high pretensions of the Argal pedigree, it must be observed that the grants and migrations to which reference is therein made are all accepted as true by cognate tribes in different parts of the Province, who have obviously no interest in maintaining a fictitious legend of Gautam pre-eminence and their own comparative inferiority. It may also be noted that according to a local saying, mentioned by Gen. Cunningham in Vol. XI of the Archæological Survey, there was once a brick temple at every kos along the bank of the Rind. The word 'bank' must of course be interpreted in its very widest sense as including the whole of the valley and its neighbourhood, and the 'kos' as meaning not that the temples were at regular intervals of that distance, but that they were very numerous and close together. The two temples of Bahuá and Tindulí might thus be included in the series, together with those that the General describes in the adjoining Pargana of Sáṛh Salímpur, and all may with great plausibility be ascribed to the Gautam Rájas, who have always been specially connected with the Rind river. Unfortunately, there are no inscriptions to confirm this conjecture, but some may yet be discovered. Accordingly, I think it desirable that the whole of the Rája's pedigree, as accepted by himself, should be put on record. The MS. in his possession from which I translate was written out about 60 years ago by one of the Kanungos of the Cawnpur district, which up to 1826 included the present Fatehpur district as a subdivision. It was evidently the work of a very careless or illiterate scribe, and is in several places quite unintelligible both to myself and to members of the family. In the mythological portion some well-known names are so grossly misspelt that they would defy recognition but for the context; thus Sántá, daughter of Somapád, appears as Santá, daughter of Lomayá; *p* and *y*, which in Nágarí are much alike, having been confused by the copyist. The MS. would seem to have been consulted by Sir H. Elliot, before writing his article on the Gautams in the Supplemental Glossary, and he has extracted from it all the facts of most conspicuous interest. But the complete genealogy, though for many generations it is only a bare string of names, may possibly hereafter be of service in helping to fix a date or determine a person mentioned in some other record.

Pedigree of the Gautam Rájpúts and of Rája Ganpat Sinh, of Argal, written out by Rám Bakhsh, Kánungo of Sárh Salímpur, according to the order of the Collector of Cawnpur (c 1826 A. D.).

1. Brahma.
2. Angiras.
3. Medhátithi.
4. Gautama.

"He celebrated a sacrifice at the hermitage of the Rishi Gokarna, from which sprung the four Kshatriya clans, the Chauhán, Parihár, Pamár and Salankhi."*

5. Satánand.
6. Ṣaradván.
7. Ṣatáník.
8. Vibhándak.

"This was the time of Droṇa, Kṛipa and Aṣvatthámá."

9. Sringi Rishi (Rishya-sringa) "who married Sántá, daughter of Somapád."

10. Ingi Rishi: "married Somantiti, daughter of Ajaypál, the Gahrwár Rája of Kanauj. Her dowry included all the land between Prayág and Hardwár, and from this date the family, who formerly were

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* Notes copied from the MS. are marked with inverted commas to distinguish them from additions of my own.

Bráhmans, began to call themselves Kshatriyas." Most other authorities give the limits of the dower as from Kanauj to Korá, which is much more intelligible.

11. Rája Randhi Dev.
12. Rája Ang Dev, "built the fort of Argal on the site formerly called Mahákáya."

In proof of the ancient sanctity of the spot, the following verse is quoted, which includes Mahákáya as one of nine famous places of pilgrimage:

Renukaḥ, Súkaraḥ, Káşí, Kálí, Kála, Batcşvarau,
Kálanjara, Mahákáya, Ukhalá, nava muktidáḥ.

The same verse is quoted, in a more corrupt form, by Gen. Cunningham in Vol. XVII of the Archæological Survey, and for Mahákáya which, it may be noted, is one of the less common names of Mahádev, he gives Mahákála. This he explains *(ignotum per ignotius)*, by Ujam, a place of which I have never heard, unless Ujam is a misprint for Ujain. Ukhalá he was told meant simply 'any sacred place' like *tírtha;* but the fact seems questionable. I am more inclined to take it as the proper name of a particular locality, possibly the village on the Jamuná (more commonly spelt Okhla) which has lately become famous as the head of the new Agra canal. Here was a tomb (now pulled down) which bore an inscription dated in the reign of the Emperor Iltitmish (1210-1235 A. D.) which evidences the antiquity of the site. As to the other places; Renuka is on the Narmada near Jabalpur; Súkara is Soron in the Eta district; Kási is of course Benares; Káli is perhaps Calcutta; Kála may be Karra on the Fatehpur border; Batesar is in Agra, though it does not appear why the name is given in the dual number; and Kálanjara is the famous fort in Bundelkhand.

13. Rája Balbhadra Dev.
14. Rája Suman Dev.
15. Rája Srímán Dev.
16. Rája Dhvajamán Dev.
17. Rája Shivmán Dev.
18. Rája Bansdhar Dev.
19. Rája Brat-dhar Dev.
20. Rája Agníndra Dev.
21. Rája Devant Dev.
22. Rája Susalya Dev "built forts at Silávan and Saan," villages in the Fatehpur district.
23. Rája Mahindra Dev.
24. Rája Jagat Dev
25. Rája Bhúmipál Dev.

26. Rája Gandharv Dev.
27. Rája Indrajit Dev.
28. Rája Brahm Dev.
29. Rája Chhatradhar Dev.
30. Rája Rám-dev Sáhi.
31. Rája Nirmán Dev.
32. Rája Prithuráj Dev.
33. Rája Tilakdhar Dev.
34. Rája Dhírmán Dev.
35. Rája Satrajít Dev.
36. Rája Bhúpál Dev.
37. Rája Paríchhat Dev.
38. Rája Mahipál Dev.
39. Rája Vishnudhar Dev "built a fort and palace at Naraicha" near Argal.
40. Rája Khasumán Dev.
41. Rája Surájmán Dev.
42. Rája Mukuṭmani Dev.
43. Rája Chandramani Dev. The Gautams of the Mirzapur district, who are very numerous there, say that they migrated from Argal in the time of Rája Chandra Sen. This name does not occur in the pedigree, but Chandramani is a near approach to it.
44. Rája Karan Dev.
45. Rája Salya Dev, "fortified Silauli."
46. Rája Gang Dev. "founded Kunvarpur."
47. Rája Dhírpunír Dev, "fought many times with Prithiráj and the Muhammadans. His Ráni went to bathe at Prayág: was assaulted by the Súbadár of Azimabad; Bhau and Bibhau of Múji-pattan, who also had gone there to bathe, came to her rescue and beat off her assailants. In return for this help, Bhupál Siñh, Gautam, of Bhaupur, gave his sister in marriage to Bhau with a dowry of 1400 villages on the other side of the Ganges. Their son* was Tilok Chand, the Ráo of Dauriya Khera. Bhúpál Siñh, Gautam, was recognized as Ráo of Gobha, and Pargana Jár was his jágir." The Ráni's champions were of the Bais clan, and the villages given in dowry constitute the tract of country known as Baiswára, which includes the greater part of the two Oudh districts of Unao and Ráe Bareli. Mr. Elliot in his 'Chronicles of Unao' gives a much more detailed version of the above famous incident, and suggests with great probability that the scene of the attempted rape was not at Allahabad, but at Baksar, another famous bathing-place, much

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* 'Son' may be used indefinitely; Mr. Elliot represents him as *seventh* in descent and puts him about the year 1400 A. D.

closer both to Bhaupur and to Dauriya Khera. Munji-pattan is in the Dekhan. The Gautams of Bhaupur are distinguished by the title of Ráwat, and those of Gobha (the next village to Argal) are still styled Ráos. Bhaupur (for Bhava-pur, Bhava being a name of Siva) is on the right bank of the Ganges; immediately below Sivarájpur.

48. Rája Ratn Sen Dev, "married the sister of Jay Chand, the Gahrwár Rája of Kanauj. Had many fights with the Muhammadans." This popular identification of the Ráṭhors with the Gahrwárs is noticeable. It is very uncertain to what clan the earlier Rájas of Kanauj really belonged. The most famous of them was Bhoja I, who reigned from 860 to 890 A. D. and was succeeded by Mahendra Pál, 921; Bhoja Deva II, 925 to 950; and Vináyak Pál, 950 to 975, all in direct descent of father and son. A period of disturbance then seems to have followed, and eventually Kanauj was conquered about 1025 A. D. by Karṇa, son of Gangaya, the Rája of Chedi near Jabalpur. He, however, was not long after expelled by Chandra Deva, who founded the well-known Ráṭhor dynasty, which terminated with Jay Chand, the rival of Prithi Ráj. The sequence of events thus stated has been worked out with much ingenuity by Dr. Hoernle, who further conjectures that Chandra Deva's father, Mahichandra (son of Jasovigraha) is the same as Mahipála of the Pála dynasty of Benares, whose father's name is given as Vigrahapála. He was a Buddhist, as his eldest son and his descendants continued to be till their kingdom (Bihár) was subdued by the Muhammadans. The younger son, Chandra Deva, becoming a Brahmanist, established his capital at Kanauj, where he was succeeded by Madan Pál, Gobind Chandra, Bijay Chandra and finally Jay Chand.

49. Rája Kaling Dev, "built the Kora fort." This was to a great extent rebuilt three generations later by Bijli Khán after becoming a Muhammadan. Nothing now remains of it but the mosque and this too would seem to be of somewhat later date. The site is a high cliff commanding a very extensive view of the Rind ravines. The buildings were dismantled shortly before the mutiny and the materials utilized in the construction of the new Tahsíli.

50. Rája Súlráj Dev. "gave a *jágir* of 62 villages about Sivarájpur to Parmál of Mahoba" after the defeat of the Chandels by Prithiráj. But this seems irreconcilable with the previous statement that No. 47 was a contemporary of Prithiráj's. This Sivarájpur is a different place from that mentioned above and is in the Cawnpur district.

51. Rája Mulráj Dev, "had two sons, of whom

52. Rája Dev Pál Dev was the elder: the younger Bijay Sinh became a Muhammadan and took the name of Bijli Khán. The Rája gave 12 villages to the Banpur Gautams; built a fort and tank at Rahnsi; fought against the Emperor." Another brother, whose name is variously

given as Bair or Bariar, or Bihál Sinh, also became a Muhammadan and took the name of Bahádur Khán, and built a fort at Gaṛhí Júr, which is still owned by his descendants.

53. Rája Mám Dev "created the Rána of Chilli, with a *jágir* of 60 villages in the neighbourhood of Majháwan" in Pargana Sárh Salímpur.

54. Rája Bhaurāj Dev "gave Har Sinh Dev the title of Ráwat with Bhaupur and other 14 villages. Gave Beduki to Kedár, a Kapariyá; Májhilgánw to Nilmani, Kurmi, and Chándpur to Chánd, a Bháṭ." Beduki must mean the town of Bindkí, which is now commonly said to derive its name from Bandagí Sháh, a Muhammadan fakir whom Kirat Sinh, one of the Gautam Rájas, had taken under his protection. The Kapariyás are a wandering tribe who go round to houses after a birth, singing congratulatory songs and receiving small presents in return. Kedár, to whom the grant was made, is said to have contrived the escape of one of the Rája's sons, who was kept as a hostage by the Muhammadans.

55. Rája Sahadev Ráj.

56. Rája Lachhman Dev.

57. Rája Bír Sinh Dev "married a daughter of the Gaharwár of Bijaipur. Fought 22 battles against the Emperor. Gave the Chaudhráhaṭ of Pargana Kora to Jaganbansi Bráhmans; 28 villages and the command of his army to the Athaiya Gautams; 12½ villages including Rámpur to Lála Tandsi Lál, Kámdár; and made a Ráj Kumár of Kharauli with a grant of 4 villages." The Athaiya Gautams (who evidently derive their name from the 28 (*atháis*) villages that were granted them) are said to have been Jinwars by descent and to have ingratiated themselves with the Rája by teaching him the game of chess.

58. Rája Madan Dev.

59. Rája Mán Dev.

60. Rája Haribaran Dev "fought against the Emperor Humáyún at Kálpi and Hamírpur and was defeated." This appears to be the turning point in the fortunes of the family, who had espoused the cause of Sher Sháh and were thus marked out for vengeance by Humáyún on his return to India. In the Gazetteer the Rája's name is incorrectly given as Harcharan.

61. Rája Sangrám Dev.

62. Rája Bhairon Sáhi "defeated by the emperor, with total ruin of the family."

63. Rája Hamír Dev "defeated by Sháhjahán."

64. Rája Bhagavant Dev "married a daughter of the Sombans Rája of Pratápgarh. The family Fort destroyed by Sháhjahán."

65. Rája Indrajit Dev.

66. Rája Ḍúgur Sáh Dev, 1607 A. D.
67. Rája Haribal Dev, 1643 A. D. "defeated by the Súbadár."
68. Rája Himmat Bahádur Dev, 1646 A. D.
69. Rája Achal Sinh Dev, 1687 A. D. "defeated in 1727 by Saadat Khán. Utter destruction of all the family property."
70. Rája Sadan Sinh Dev 1729 A. D.
71. Rája Amán Sinh, 1755 A. D.
72. Rája Ganpat Sinh, 1817 A. D.
73. Rája Lál Shio Rám Sinh, born 1837 A. D.
74. Kunvar Ratu Sinh.

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On the Geography of India in the Reign of Akbar. Part II.—*By* JOHN BEAMES, B. C. S.

(With a Map.)

No. II. ṢUBAH BIHAR.

In reconstructing the details of this large and important province very great difficulties have to be encountered. It is not so much that changes have taken place, for that has happened everywhere; but that for a long time past no record has been kept of such changes, rather there has been at one time an effort to obliterate all traces of them, and at another a policy of deliberately refraining from enquiring into them. The intentional falsification of the fiscal records by the later Muhammadan Subahdars, and the Permanent Settlement of Lord Cornwallis have each in its own way done much to efface the former political geography. That so many of the old parganahs are still traceable is due more to the conservative instincts of the people, than to any care that has been bestowed upon the matter by those in authority.

Even in Todar Mal's time parts of Bihár seem to have been somewhat imperfectly known. In the whole of the large Sarkár of Múngír (now generally written Monghyr) the areas of the mahals are wanting, and in some of the other Sarkárs also we find areas omitted here and there. The information regarding the contingents of horse and foot soldiery to be furnished is not given in detail for each mahal, but in most cases only in the lump for each Sarkár, and the castes or tribes of the proprietary families are only mentioned in a few instances. Moreover there are large areas on the map which are not covered by any of the mahals named in the lists, and which we must therefore assume to have been unassessed, and probably uninhabited, in those days.

When we examine the extent and boundaries of the whole province as given in the Aín we find nevertheless that they correspond tolerably closely to those of the present day. The length is said to be from Gaṛhi to Rohtás 120 kos. Gaṛhi is the old fort now known as Teliágaṛhi a little to the west of Sahibganj at the point where the Santhál Hills touch the Ganges. This fort was regarded as the key of Bengal, and the beginning of that province. By Rohtás we must understand, not the historical fortress of that name, but the western boundary of the Sarkár of which it was the capital, for the fortress itself as will be seen from the map lies far to the east of the boundary. Taking Akbar's kos at about 2½ English miles,* the distance would be about 300 miles; but this must have been obtained by measuring along the then existing roads, for the actual distance as the crow flies is only 210 miles.

Similarly the breadth from north to south, which is vaguely described as being from Tirhut to the hill ranges, meaning evidently the northern ranges of the Vindhyas, is given as 110 kos = 275 miles. But measuring as the crow flies on the modern map from the northern boundary of Tirhut to the southern boundary of Monghyr,† we find the actual distance not more than 160 miles. It will also be seen further on that some of the mahals included in Sarkár Tirhut are now under Nepal, and that it is impossible to decide how far to the south among the scattered and broken groups of hills which run all through this part of the Subah, Muhammadan power, or at any rate Muhammadan pretensions, extended.

Abul Fazl states the boundaries of the Subah as follows. On the east Subah Bangálah (Bengal), on the west Subahs Iláhabád and Avadh, on the north and south high mountains, meaning of course the Himalayas and Vindhyas respectively. These boundaries correspond with tolerable accuracy to the present ones on the east and west, though they can hardly be said to be defined at all on the north and south any more than they are in the present day. On the north disputes with the Nepal State have recurred at intervals down to the present time, and on the south the boundaries between districts in the Bihár Province and those in Chota Nágpur are varied from time to time to suit the exigencies of modern administration. The country is hilly and irregular, and it is difficult to draw a definite line of demarcation between the tracts inhabited by an Aryan population, and those inhabited by Kolarian and Dravidian tribes, such as Santhals, Khonds and Koles. The former only would, it may be supposed, be included in the Subah.

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* Elliot. Races of N. W. P. vol. ii, p. 194. The exact length is 2 miles 4 furlongs 158 yards.

† I mean the modern districts bearing those names, not the Sarkárs of the Aín.

The southern boundary has in fact always been vague and undefined. The Muhammadan forces consisting as they did, chiefly of cavalry, seem to have been very easily beaten back from broken or rocky country, and it will be seen further on how even the insignificant hills which cut in two the southern part of the province impinging on the Ganges at Múngír, remain independent down to a comparatively late period, and how the names of the mahals in Sarkar Bihár and Múngír testify to the scattered nature of Muhammadan power in those parts.

The Ganges, Son, and Gandak are mentioned as the chief rivers of the province, and a petrifying power is ascribed to the waters of the Son. This is true only of certain springs in the upper part of its course. It is also correctly stated that the Son, Narbadda and Jhulá rivers all rise close to each other on the Amarkantak mountain.* But on the whole the geographical details regarding this Subah are decidedly meagre when contrasted with those of Subahs nearer the capital.

Todar Mal's Settlement of A. D. 1582 lasted unaltered only for about a century, a fresh Settlement having been made in the 27th year of Aurangzeb, A. D. 1685—by which the total revenue of the province was raised from fifty-five to eighty-five lakhs. The only territorial change was the division of the old Sarkár of Ruhtás into two; Ruhtás and Bhojpúr.

This Settlement did not remain in force so long as its predecessor having been superseded in 1750, at a time when the power of the Mughal dynasty had virtually come to an end, by a fresh Settlement the details of which were carried out by Jánaki Rám the Naib Diwán of Bihár, under the orders of Ali Vardi Khán, Subahdár of Bengal. The revenue was now further raised to ninety-five and a half lakhs. Although the old territorial divisions of Sarkárs and mahals remained nominally unchanged, there were nevertheless in reality very great changes made. It would lead me too far from my present subject to enter into details of these changes, and they could not be understood without reference to official maps which are not available to the public. The object aimed at was the increase of the revenue levied from the people to the highest practicable point, while the increase of revenue payable to the central Government should be as small as possible, so that there might remain a very great difference between what the Subahdar had to receive from those below him, and what he had to pay to those above him; such difference naturally going into his own pocket. Another object was to carve out for favourites and dependants new estates in various parts of the province without reducing to a corresponding extent the revenue demandable from the landholders whose estates were thus encroached upon and diminished. With this view a village here and a village there, a few bighas in one place and a few more in another, were created into an estate, the grantee of which had to pay a certain revenue, while the persons from whose estates these pilferings had been made still continued to pay their old rent, or at most a rent only slightly reduced.

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* There is apparently an error in the Persian text of the Ain (Vol. I, p. 416) where the Son is said to fall into the Ganges from the north instead of from the south. The text is here, however, corrupt. That the Son is meant seems clear from the mention of Munir as the point of junction. If we can read the doubtful word نيرزو or نرو as سريو *saryu*, the passage would refer to the Ghográ, which does fall into the Ganges from the north oppposite Munir. Possibly the word بي or ني preceding نيرزو may be for naï = ندي *nadí* 'river;' as Abul Fazl sometimes employs Hindí words.

These tactics were followed by large proprietors in respect of their own estates, and in fact every one who was powerful enough to rob the State or his neighbours, robbed to his heart's content. In addition to this constant spoliation and forcible transfer of estates, there was the unceasing resumption of rent-free tenures, and the creation of all sorts of fresh imposts, under the generic title of *s'áir* or "remainder," and other quaint technical names, mostly in order to provide an income for the various ranks of officials, or to meet some new extravagance of the Subahdar himself. Whosoever wishes to bewilder himself by an examination of this extraordinary complication of revenue matters, may read Mr. J. Grant's Analysis of the Finances of Bengal, and may wonder at, though he will probably not understand, the remarkable skill with which the writer disentangles the web of accounts, and produces as the result the "Jamá tashkhís bandobasti" of A. D. 1765, on which the Permanent Settlement was based. With the Permanent Settlement the curtain falls on the subject; and from that time to the present all is darkness.

I now proceed to the details of this Subah. It contained seven Sarkárs, *viz.*:—

Bihár.
Múngír.
Champáran.
Hájípúr.
Sáran.
Tirhut.
Ruhtás.

Comprising 199 mahals or parganahs. The total revenue is given in the introductory remarks as dams 22, 19, 19, 404 of which dams 17, 26, 81, 779 are from *naḳdí*, and dams 4, 92, 37, 630 *sayúrghál*. These figures, however, do not agree with the result obtained by adding together the revenue of each of the seven Sarkárs as given in the lists which follow the introduction. The total of the figures for the Sarkárs is dams 38, 51, 18, 242.* As regards the area no definite statement can be arrived at, for though the total area is given in the introduction as 24,44,120 bigahs, these figures refer only to the measured (*i. e.*, cultivated) area "zamín-i paimúdah" and in the Sarkár lists detailed areas are wanting for all the parganahs of Sarkár Múngír and many of those in the other Sarkárs.

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* See Thomas's Pathan kings of Delhi, p. 388, for a discussion as to the accuracy of Abul Fazl's figures.

I. SARKÁR BIHÁR.

46 mehals. Area 9,52,598 bigahs. Revenue 8,019,639 dams naḳdí under the head of zabti* and naḳdi: 2,270,147 sayurghál. Castes various. 2,115 horse 67,350 foot.

1.	Arwal.	5,79,089 b. 5 b. 4,26,780 d. 1000 foot.
2.	Ukhrí.	49,401 b. 10 b. 3,747,940 d.
3.	Ikal.	40,404 b. 4 b. 3,35,260 d. Bráhmans and Afgháns. 200 foot.
4.	Amretú.	24,387 b. 19 b. 1,821,333 d. 16,035 s.
5.	Amblo.	8,47,920 d. Bráhmans 250 foot.
6.	Anchhá.	10,290 b. 7 b. 6,700,000 d. Afgháns. 20 horse. 300 foot.
7.	Antarí.	1,998 b. 9 b. 1,47,980 d. Káyaths. 20 horse. 200 foot.
8.	Bihár bá havelí.	Has a fort of stone and burnt brick. 70,683 b. 9 b. 5,534,157 d. 6,53,200 s. 10 horse. 400 foot.
9.	Bhiláwar.	48,310 b. 3 b. 3,651,640 d. 9000 s. Bráhmans. 500 foot.
10.	Biswak.	35,318 b. 18 b. 2,706,539 d. 1,708,130 s. Shaikhzádahs. 300 foot.
11.	Pilich.	30,030 b. 18 b. 2,270,438 d. 59,185 s. Bráhmans. 500 foot.
12.	Baliá.	26,000 b. 18 b. 2,056,502 d. 85,747 s. Rájputs. 20 horse. 400 foot.
13.	Patna.	Has two forts, one of burnt, the other of unburnt brick 21,846 b. 8 b. 1,922,430 d. 1,31,807 s.
14.	Phulwárí.	20,225 b. 19 b. 1,585,420 d. 1,18,120 s. Rájpúts. 20 horse. 700 foot.
15.	Pahrá.	12,283 b. 6. b. 941,160 d. 18,560 s. Bráhmans. 20 horse. 400 foot.
16.	Bhímpúr.	10,862 b. 15. b. 824,584 d. 24,424 s.
17.	Punḍág.	727,640 d. Jabardah. 300 horse. 2000 foot.

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* "Zebty, resumed lands appropriated in jageer to defray the expenses of the standing military force," but subsequently "included in the receipts of the royal treasury." (Grant's Analysis, p. 255.)

18.	Tiláḍah.	39,053 b. 12 b. 2,920,366 d. 232,080 s. Shekhzádahs 20 horse. 300 foot.
19.	Jarar.	12,930 b. 10 b. 979,363 d. 880 s. Shekhzádahs. 20 horse. 500 foot.
20.	Chirgáṇw.	904,440 d. Bráhmans. 20 horse. 300 foot.
21.	Jaychampá.	620,000 d. Jabardah. 20 horse. 600 foot.
22.	Dádar.	262,500 d.
23.	Dhakuair.	215,680 d.
24.	Rúḥ.	250,100 d. Bráhmans. 20. horse. 1500 foot.
25.	Rámpúr.	363,820 d.
26.	Rájgaṛh.	3,756 b. 12 b. 288,228 d. 17,225 s.
27.	Sunaut.	36,780 b. 7. h. 28,24,180 d. 20 horse. 500 foot.
28.	Samái.	32,514 b. 3 b. 2,537,080 d. 62,380 s. Káyths. 10 horse. 200 foot.
29.	Sihrah.	20,79,000 d. Rájpúts. 500 feet.
30.	Sánḍah.	24,962 b. 2 b. 1,889,956 d. Afgháns. 500 foot.
31.	Siyúr.	Stone fort on top of a hill. 14,145 8 b. 1,250,591 d. Bráhmans. 200 horse. 5000 foot.
32.	Ghayáspúr.	84,205 b. 5,657,290 d. 227,554 d.
33.	Gídhaur.	Stone fort on top of a hill in the middle of the jungle. 1,452,500 d. Rájpúts. 259 horse. 10,000 foot.
34.	Kátíbhará.	7,37,540 d.
35.	Kábar.	7,400 b. 9 b. 5,60,875 d. Káyaths. 30 horse. 700 foot.
36.	Gúh.	374,880 d. Rájputs. 100 horse. 1000 foot.
37.	Ghátí Bihá	
38.	Karanpúr.	363,820 d.
39.	Gayá.	951 b. 74,270 d. 14,235 s.
40.	Munir.	89,039 b. 15 b. 7,049,179 d. 325,380 s.
41.	Masauḍhá.	67,161 b. 10 b. 4,631,080 d.
42.	Máldah.	28,121 b. 9 b. 2,151,575 d. 49,805 s. Bráhmans. 100 horse. 3000 foot.
43.	Manaurá.	7,706 b. 6 b. 585,500 d. Bráhmans. 20 horse. 500 foot.
44.	Mahair.	23,937 b. 19 b. 1,779,540 d. 47,700 s. Bráhmans. 200 foot.
45.	Narhat,	30,555 b. 7 b. 2,380,309 d. 5 horse. 200 foot.

At the beginning of the list it is stated that there are 46 mahals, but the list itself only contains 45. Either Bihár is to be counted as two mahals, one for the Havelí, and one for the Baldah, or No. 21 Jaychampá must be counted as two, as the modern parganahs of Chai and Champá are distinct from one another, and may have been so in former times.

It is important to observe the situation of the mahals whose area is given as distinguished from those for which only the revenue is stated, as this distinction affords a means of judging how far Muhammadan supremacy really extended. On comparing the list with the map accompanying this article it will be seen that the mahals whose measurement is given are those lying in the great plain of Bihár, while most of those in and between the hills are unmeasured, and there is every reason for believing that they had not at the time of the Settlement been really conquered.

I have succeeded in identifying all but two out of the forty-five mahals of this Sarkár, though some are only conjecturally traceable.

5. Amblo. There is no pargana of this name now extant in either Gya or Patna districts. There is Amlo (now called Amlo Mutia) in Bhágalpúr, but that is separately given under Sarkár Múngír. It is just possible that in the general ignorance that prevailed regarding the outlying parts of of Sarkár Bihár this mahal may have been entered twice over by mistake. It is one of the unmeasured mahals many of which were put down by Todar Mal from hearsay or other vague indications.

16. Bhímpúr is still extant, but it was formerly larger than at present, a new parganah Shahjahánpúr having been carved out of it, the name of which shews that its creation was later than Akbar's days.

17. Pundág is the same as Palámau and roughly indicates a vast tract of country lying south of Sherghotty and only nominally subject to the empire in the time of Akbar as it was not conquered till the reign of Aurangzeb,* though there had probably been occasional raids into various parts of the country before, and the name was therefore known to Todar Mal and inserted in his rent roll with a purely imaginary revenue. The name of the proprietary clan in this and No. 21 is given as جبرده Jabardah in the Persian text; but this is a copyist's error for چیروه *cheroh*, the Muhammadan way of spelling the name of the well known aboriginal Chero race.†

21. Jaychampa. Properly Chai Champa two contiguous parganahs now in the north of Hazaribagh district, invaded about A. D. 1340 by a general of Muhammad Tughlak.‡ The old fort of Chai is still in existence. These mahals like Pundág were probably only known by hearsay to Todar Mal and not actually subject to the Empire.

23. Dhaknair. Properly spelt Dakhnair, *i. e.*, Dakshiṇa°nagara. Nagara becomes *nayara* in Prákrit, *e. g.*, Bikanír, Bhatnair, etc.

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* See a full account by Blochmann in J. A. S. B. Vol. XL, p. 111.

† *ib* p. 118.

‡ Col. Dalton's note in Huntor's Statistical Account of Hazaribagh, p. 67.

25. **Rámpúr.** An unmeasured mahal probably the pargana of that name in Hazáribagh, known to, but not possessed, by the Mughals.

26. **Rájgaṛh.** The celebrated Buddhist centre Rajgir. Abul Fazl has substituted the familiar termination *gaṛh* for the less common *gir* from Rájagṛiha the original Sanskrit name.

29. Sihrah. There is now no parganah of this name, the village of Sahra is in the south-east corner of Ghayáspúr.

31. Siyúr. There is no parganah of this name, but the fort of Sior or Siyúr Muhammadabad is well known. It is in parganah Rúh and the mahal dependent on it seems to have been very extensive including not only Pachrukhi but also the great zamindárí of Kharakdihá in Hazaribágh.* It is strange that its area should be given, while that of Rúh is not. The measurement, however, can refer only to a very small portion of the whole of this vast territory.

33. Gidhaur. Gṛidhrapúra = vulture-city. This is the capital of the great estate of this name; even in Akbar's time the Rája was one of the great chiefs of Bihár. The mahal included the modern pargana of Chakái and stretched nearly as far as Rohiñí.

34. Kátíbhará. I have been unable to identify this place.

37. Ghátí Bihár. This is now called Shahr ghátí (vulgo Shergotty) and is a large and well known place at the foot of the gháts or mountain passes leading from the highlands of Chutia Nágpúr to the plain of Bihár.

38. Karanpúr. A large parganah of this name is still extant south of the town of Hazaribágh.* It was probably entered on the rent roll by Todar Mal merely on hearsay, the name having become known from the Muhammadan raids on Kokrah and Pundág. It could not have been actually subject to Akbar.

The Sarkár of Bihár thus reconstructed occupies the whole of the modern districts of Patna and Gaya, the western half of the great plain of Magadha. It also includes certain tracts now included in the districts of Hazaribágh and Lohárdagá in the Chutiá Nágpúr country, but as has been shown above, these latter tracts, such as Pundág, Chai-Champá, Karanpur, etc., were rather claimed, than possessed by the sovereign of Delhi, and it is impossible to say how far they extended. In the map which accompanies this article they have not been coloured but merely indicated by a line under the name.

It may be interesting to students of the science of language to notice that the area of this Sarkár corresponds pretty accurately with the area of the modern Magadhí dialect of Bihár as shewn in the map prefixed to Part I of Mr. Grierson's grammars of the Bihárí language recently published. In fact the dialectic boundaries throughout this Subah correspond in a remarkable manner with those of the Sarkárs. Thus Sarkárs Ruhtás, Sáran and Champáran speak Bhojpúrí, Sarkár Bihár Magadhí, Sarkárs Tirhut, Hajipúr and Múngír Maithilí.* This coincidence may be merely accidental, and due to the fact that the language boundaries were decided by the same considerations as the administrative boundaries, namely, the leading natural features of the country such as hills, rivers and so on. There are, however, parts where no such natural boundary exists, and in those the coincidence is not easily to be accounted for. The remarkable tongue-like projection of Magadhí south-eastwards beyond Jamui almost as far as Deogaṛh is apparently to be accounted for by the fact that all that country belonged to the Rájas of Gidhaur who on conquering it from the Santhals probably settled it with cultivators from the western parts of their territory who naturally spoke Magadhí.

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* Ibid, p. 129.

II. SARKÁR MÚNGÍR.

31 mahals, 109,625,981½ dáms. Castes various. 2,150 horse. 50,000 foot.

1.	Abhaypúr.	20,00,000 d.
2.	Uslá.	89,760 d.
3.	Ango.	147,800 d.
4.	Amblo.	50,000 d.
5.	Bhágalpur.	46,96,110 d.
6.	Baliá.	32,87,320 d.
7.	Pharkiyah.	30,00,000 d.
8.	Pahárpárah.	140,920 d.
9.	Pasaí.	132,300 d.
10.	Tanúr.	88,420 d.
11.	Chhai.	92,80,000 d.
12.	Chanduí.	3,60,000 d.
13.	Dharmpúr.	40,00,000 d.
14.	Ḍánḍ Sukhwáráh.	1,36,000 d.
15.	Rohiní.	95,360 d.
16.	Sarohí.	17,73,000 d.
17.	Sukhdhará.	670,240 d.

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* I think, however, that Mr. Grierson has carried northern Maithilí too far to the east in Purniah and the Morang. I was Collector of that district for four years, and my impression is that Maithilí is confined to the parganah of Dharampúr which formed part of Sarkár Múngír. In central and northern Purniah the language is utterly corrupt and too much mixed with Bengalí to be fairly called Maithilí. This, however, will be decided by Part VII of the Series of Grammars.

18.	Singhaulí.	360,000 d.
19.	Súrajgaṛh.	2,99,445 d.
20.	Sikhrá ábádí.	1,60,000 d.
21.	Saṭiárí.	58,730 d.
22.	Kahlgánw.	28,00,000 d.
23.	Kherhi.	689,044 d.
24.	Kojrah.	260,602 d.
25.	Kheṭki.	160,000 d.
26.	Lakhanpur.	633,280 d.
27.	Masjidpur.	12,59,750 d.
28.	Múngír bá Haveli.	808,907½ d.
29.	Masdí.	29,725 d.
30.	Hindue.	108,300 d.
31.	Hazártakí.	9,182 d.

In this Sarkár it is noticeable in the first place that not a single mahal contains more than a statement of the revenue payable by it. There is no information as to area, ruling castes, or anything else. This is the more remarkable because Todar Mal himself resided for some time at Monghyr, though it is true he was at that time more intent on warlike than on financial pursuits. There is much to shew that all this south-eastern corner of Bihár was very imperfectly known to the Muhammadans, for instance, the important and well known estate of Kharakpúr does not occur as the name of a mahal at all. It is still the largest estate in south Bihár though it has passed away from the ownership of the ancient line of Rájas. Blochmann has discovered from the Akbarnáma that at the time of the conquest of Bengal and Bihár by Akbar Rája Sangrám Sahaí of Kharakpur was one of the three principal chiefs of the country, and as he submitted to Akbar and with the exception of one or two passing revolts remained on the whole tolerably submissive all that reign one would expect to see his estate figure on Todar Mal's list. The only way to account for the omission is to suppose that Kharakpur itself was not at that time a separate mahal, and as nearly the whole of it consisted of hills either barren or covered with jungle there was probably no assessment, or if brought on the books at all, any assessment there might be would probably be Sayúrghál, and as no Sayúrghál is recorded for this Sarkár, the name of Kharakpúr would not find entry. All or nearly all the other parganas in this vast estate are duly mentioned, *viz.*, Dándá Sukhwára, Hendueh, Hazártaki, Lakhanpur, Masdi, Pahárpárah, Sahrúi, Sukharábádi, Amlo Mutia, Wasila and Kherhi, and it may be supposed that the land on which the fort and town of Kharakpur stood was included in one or other of these parganahs.

Of the mahals entered in the above list all but three are still extant though probably the area of many of them has varied considerably.

2. Uslá is now written Wasílá.

3. Ango, not traceable.

4. Amblo, now called Amlo Mutia far down in the south of the Bhagalpúr district.

8. Pahárpárá. This word is written in the text پتهرارا with a var. lectio پچهرارا I propose to read پهارپارا and to identify the mahal with that now called Parbatpárá, *parbat* and *pahár* meaning the same thing.

10. Tanúr. The record-keeper of the Monghyr Collectorate conjectures that the true reading is تہور, there is a mahal of this name Tahaur or rather Tahaurganj in Kharakpúr. This seems a somewhat doubtful identification. There is no place called Tanúr, as far as I can learn.

16. Sarohi now written شہروي Sahroi.

17. Sukhdhará seems to be a mistake for Sukhohará due to the similarity between د and و. It was once a separate pargana but is now included in Haveli Monghyr.

21. Satiárí now included in Bhágalpur.

25. Khetki not traceable, but is probably intended for Khetauria.

This Sarkár runs far down south-eastwards into the jungly tracts now in the Santhal Parganas and it is impossible to fix any definite boundaries in that direction. Probably the Muhammadans did no more than make occasional raids into this wild and difficult country, and the mahals lying in this direction, such as Hindue (Handoi, Hendueh, etc.), Rohiní and Pasai have therefore been treated in the same way as Pundág and Chai Champá of Sarkár Bihár, and merely underlined.

In the north too the parganas of Pharkiyá and Chhai covered vast areas of sparsely peopled swamps and marshes and it is uncertain how far their boundary could be held to extend, on the north. Much of the country included in the modern parganas of Náthpúr, Dhaphar, Náridigar and Nisankhpúr Korá was down to comparatively recent times under the rule of the Nepalese government. None of these names are found in the Aín under Sarkár Múngír, though as will be shewn further on it is possible that some part of this country is included under one or other of the easternmost mahals of Sarkár Tirhut. The large mahal of Dharmpúr now lying east but formerly west of the great Kosi river which has changed its course within recent times,* forms the eastern frontier of Bihár and its boundary with Sarkar Púrniah of Subah Bengal is distinct and unmistakeable, but how far it went to the north cannot now be said with any certainty.

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* **Almost within the memory of living men the Kosi flowed to the north-east of the town of Purniah and its old course may still be clearly traced by a broad and deep depression in the soil running for some fifty miles across the district. Even**

III. SARKÁR CHAMPÁRAN.

3 mahals. Area 85,711 b. 5 b. 55,13,420 d. 700 horse. 30,000 foot.

1.	Simráṇw.	7,200 b.	2 b.	5,90,095 d.
2.	Mihsi.	56,095 b.	7 b.	35,18,435 d.
3.	Majhowa.	22,415 b.	16 b.	14,04,890 d.

All three mahals are still extant. Simráṇw lies partly in British territory and partly in Nepal. The ruins of the old capital of Simráṇw (Samara gráma = battle-village) lie among dense jungle just across the Nepal frontier. Mihsi or Mahsi lies to the south of it.

3. Majhowa is a very large parganah in the present day stretching as far as Tribeni Ghat, the point where the Gandak issues from the hills. It was not so large in the time of Akbar, for the great forest of the Champak tree from which the district takes its name (चम्पकारण्य champaká-raṇya = Champáran) was not fully conquered and settled by the ancestors of the Mahárája of Bettiah nor was the now flourishing town of Bettiah founded till a much later date. I have shewn on the map only the eastern and southern boundaries of this mahal, it is impossible to say how far it may have extended in a north-westerly direction. It, however, probably touched on Sarkár Gorakhpúr in Subah Avadh just across the Gandak river, much of which especially on its eastern frontier was covered with forests.

IV. SARKÁR ḤÁJÍPÚR.

11 Mahals. Ten towns قصبه 436,952 b. 15 b. 2,73,

1.	Akbarpur.	3,366 b.	17 b.	1,95,040 d.
2.	Busáḍí.	10,851 b.	14 b.	6,24,791 d.
3.	Bisárá.	1,06,370 b.	7 b.	63,80,000 d.
4.	Bálágachh.	14,638 b.	2 b.	9,13,660 d.
5.	Patkhará.	58,306 b.	13 b.	35,18,354 d.
6.	Hájípúr Havelí.	62,653 b.	17 b.	38,33,460 d.
7.	Ratí.	30,438 b.	13 b.	18,24,980 d.
8.	Suresá.	1,02,461 b.	8 b.	27,04,300 d.
9.	'Imádpúr.	12,987 b.	7 b.	7,95,870 d.
10.	Kadahsandh.	8,76,200 d.		
11.	Naipúr.	27,877 b.	9 b.	16,63,980 d.

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within my own period of service the Kosi has removed many miles to the west of the course shewn on the Atlas of India and other comparatively recent maps; one stage of its frequent changes is marked by the chotá Kosi which still forms the boundary of pargannah Dharampúr.

The whole of the above parganahs are still in existence and clearly identifiable under their ancient names. Even in the cases of Nos. 5 and 10 there is no doubt as to what is meant.

2. Is usually spelt in the present day Bhusaḍah بہوساڈہ

3. Bisárá is a very large pargannah, now broken up into Tappas, the names of which are more used than that of the pargannah itself. Its actual situation and extent, however, are well-known.

5. Patkhará پتکہرا is the reading given in Blochmann's text. He gives, however, in a note a *var. lect.* تیگہرا and this is correct. The old pargannah of Teghará lying along the left bank of the Ganges, in the south-east corner of the Sarkár, is now known as Mulki, but the town of Teghará still retains its old name.

10. Kadahsand. This name is spelt in many ways in various MSS. but there can be no doubt that by it is meant the present pargannah of Gadehsar occupying the north-western point of the Sarkár.

This Sarkár is a long and rather narrow strip comprising the tract between the Burh Gandak river on the north-east, and the Gandak and Ganges on the south-west and south. North of the Burh Gandak lies Sarkár Tirhut, though in later times that name was applied to a much larger area.

V. SARKÁR SÁRAN.

17 mahals. Measured area 229,052 b. 15 b. 60,172,004½ d. Castes various. 1000 horse. 50,000 foot.

1.	Andar.	7,218 b.	4 b.	5,34,990 d.
2.	Baráí.	7,117 b.	10 b.	5,33,820 d.
3.	Bál.	66,320 b.	5 b.	48,93,378 d.
4.	Bárá.	15,059 b.	3 b.	383,797½ d.
5.	Narhan.	8,611 b.	8 b.	6,54,508 d.
6.	Pachlakh.	9,266 b.	15 b.	4,87,997 d.
7.	Chirenḍ.	8,413 b.	13 b.	6,33,270 d.
8.	Chaubárá.			4,00,000 d.
9.	Júínah.	6,763 b.	8 b.	3,09,282 d.
10.	Dígsí.	5,825 b.		2,77,630 d.
11.	Sipáh.	2,662 b.		2,90,592 d.
12.	Goá.	28,049 b.	3 b.	20,12,950 d.
13.	Kalyánpúr.	17,437 b.		7,74,496 d.
14.	Kashmír.	16,915 b.		13,14,539 d.
15.	Mángjhi.	8,752 b.	19 b.	6,11,813 d.
16.	Manḍhal.	9,405 b.	7 b.	6,97,140 d.
17.	Makír.	10,936 b.	14 b.	8,11,095 d.

This Sarkár like that of Champáran has no Havelí; but it is well preserved. In the present day sixteen out of Todar Mal's seventeen mahals are in existence, though some of the modern names differ slightly from those in the Aín.

5. Narhan is entered here though not its proper place in alphabetical order, because it is by mistake written Barhan in the Aín. There is, however, no doubt that Narhan is meant.

7. Chirend now callad Chiránḍ.

9. Júínah. There is no parganah of this name. I suspect the real reading is Chausah (چوسه for جوینه), which, according to Grant who calls it "Choseh," was transferred to Sarkár Gorakhpúr at some time between 1750 and 1765 A. D.

10. Digsí is for Dhangsí, a mistake of dots only.

14. Kashmír is now called, and has apparently been always called Kasmar; the substitution of the better known name of the mountain kingdom which Akbar was then in process of absorbing into the Empire is a characteristic touch of the politics of the time.

15. Mángjhí, now, and probably always, Mánjhí. It is difficult to account by any phonetic process for the presence of the گ.

16. Manḍhal now Maṛhal which is the same word under a slightly different pronunciation (मंढल or मढ़ल).

VI. Sarkár Tirhut.

74 mahals. Measured area 2,66,464 b. 3 b. 1,91,89,777½ dáms.
Castes various. 700 horse. 80,000 foot.

1.	Ahispúr.	4,880 b.		3,02,550 d.
2.	Utarkhanḍ.	2,068 b.		1,28,412 d.
3.	Ahilwár.	1,001 b.	1 b.	62,212 d.
4.	Ubhí.	60,000 d.		
5.	Ughárá.	836 b.	15 b.	53,980 d.
6.	Aṭháís.	559 b.	17 b.	34,356 d.
7. to 10.	Basrí and others.	4 mahals		11,25,000 d.
11.	Bharwárah.	16,176 b.		9,42,000 d.
12.	Nánpúr.	40,347 b.		8,94,792 d.
13.	Barel.	6,185 b.		7,89,858 d.
14.	Píprá.	1,823 b.	18 b.	1,12,591 d.
15.	Paḍrí.	9,048 b.		5,54,258 d.
16.	Basotrá.	8,864 b.		5,46,627 d.
17.	Pachhí.	5,816 b.		3,61,950 d.
18.	Bahnur.	5,033 b.		2,897,773½ d.
19.	Bachhnur.	4,956 b.		275,185 d.

20.	Pachhim Bhigo.	4,095 b.		271,826 d.
21.	Bagḍá.	3,716 b.		267,862½ d.
22.	Púrab Bhigo.	3,022 b.	17 b.	2,22,280 d.
23.	Pandrájah.	3,135 b.	4 b.	195,837½ d.
24.	Búdí Bhúsáḍí.	2,823 b.		1,75,585 d.
25.	Bhálá.	2,840 b.		1,25,437 d.
26.	Bhadwár.	2,087 b.		130,471½ d.
27.	Parihárpúr.	1,968 b.		121,067½ d.
28.	Bahádurpúr.	1,936 b.	12 b.	115,305 d.
29.	Baraí.	1,455 b.	12 b.	90,369½ d.
30.	Parihár Rágho.	1,303 b.	17 b.	81,605 d.
31.	Bhaurá.	1,170 b.	9 b.	69,608 d.
32.	Pulwárah	1,060 b.	4 b.	65,627 d.
33.	Búrá.	875 b.	15 b.	55,757 d.
34.	Banwá.			40,539 d.
35.	Parihárpúr Jabdí.	6,040 b.	14 b.	37,736 d.
36.	Pengí.	505 b.	5 b.	31,550 d.
37.	Búchháwár.	188 b.	10 b.	12,875 d.
38.	Barsání.	200 b.	18 b.	12,695 d.
39.	Tarání.	7,171 b.		443,242 d.
40.	Tilok Cháwand.	2,211 b.	7 b.	149,896 d.
41.	Tájpúr.	1,351 b.	14 b.	85,434 d.
42.	Ṭánḍah.	1,038 b.	4 b.	63,768 d.
43.	Tarson.	980 b.	4 b.	61,180 d.
44.	Tirhut Haveli.	21,397 b.		1,307,706 d.
45.	Jákhar.	17,140 b.		1,068,020 d.
46.	Jaráil.	8,297 b.		515,732 d.
47.	Chakmaní.	5,173 b.		321,326 d.
48.	Jakhalpúr.	3,092 b.		196,020 d.
49.	Jabdí.			54,025 d.
50.	Dharaur.	3,165 b.		159,052 d.
51.	Darbhangá.	2,038 b.		202,818 d.
52.	Rám Cháwand.	7,409 b.		470,005½ d.
53.	Sareshṭá.	15,474 b.		941,010 d.
54.	Salímpúr.	458 b.	14 b.	29,094 d.
55.	Salimábad.	44 b.	15 b.	4,184 d.
56.	Sanjaulí Tadrá.	2,450 b.		150,843½ d.
57.	'Alápúr.	8,796 b.		442,466 d.
58.	Faḳírábád.	1,170 b.	6 b.	72,355 d.
59.	Kahnaulí.	4,644 b.		408,804 d.
60.	Gaṛh Cháwanḍ.	5,510 b.		349,480½ d.
61.	Kodá Khand.	3,888 b.		243,677 d.

62.	Korádí.			9,000 d.
63.	Khandá.	330 b.	6 b.	21,443 d.
64.	Ladwárí.	2,609 b.		142,495 d.
65.	Mahilá.	15,295 b.		942,048 d.
66.	Morwah.	8,289 b.		515,485 d.
67.	Mahend.	1,077 b.	12 b.	66,693 d.
68.	Narangá.	632 b.	18 b.	39,022 d.
69.	Malhní.	151 b.	1 b.	9,728 d.
70.	Noram.			288,140 d.
71.	Nautan.	3,381 b.	7. b.	209,153 d.
72.	Háthí.	2,563 b.	18 b.	159,790½ d.
73.	Hirní.	796 b.	17 b.	50,342 d.
74.	Hávi.	3,665 b.	8 b.	230,700 d.

It would be a mistake to infer from the very great number of parganahs it contains that this Sarkár is larger than the others in this Subah. In fact it covers less area than Sarkárs Bihár or Múngír; the parganahs of which it is composed are in many instances very small, so small that they can hardly be shown on a map of moderate dimensions. I have had to indicate some of them by numbers. The Sarkár is one of the most difficult to reconstruct of any outside Bengal, many changes have taken place both in the names and arrangement of the parganahs and there are large areas absolutely unaccounted for. In dealing with tracts lying north of the Ganges we have always to take into consideration the fact that the extent of the *tarái* or submontane forest varies at different points in the most capricious manner, in some places stretching far down to the south and being apparently omitted from Akbar's census, while at others parganahs are mentioned which lie close up under the hills and are now included in Nepal. Of the 74 mahals comprised in this Sarkár some are not to be found at all in the present day, while on the other hand there are several modern parganahs, some of them very large, which are not mentioned in the Aín. It is probable, in fact almost certain, that the older and now untraceable mahals are represented by these modern parganahs, but which modern name corresponds to which ancient name is a mystery I have not been able to solve either by enquiry on the spot or by any other means. During the greater part of the period lying between our own day and Akbar's, Tirhut has been under the rule of the great house of Darbhangá, and it was probably by the successive Rájas that the changes were made which appear to have obliterated so many of the old fiscal divisions. I am, however, informe by good authority that even the Kánúngo's papers do not contain any record of these changes. It seems therefore hopeless to attempt any further elucidation. Such facts, and more or less probable conjectures, as I have been able to arrive at are included in the following notes. The mahals not mentioned are still extant under their old names, though it is of course quite uncertain whether their present area is the same as their former; in all probability, it is not.

4. U'bhí. No parganah of this name. The most probable conjecture, though it is no more than that, is that for اوبهي we should read اوٹهي Oṭhi. This is said to have been the local name for the country lying on the extreme east of the Sarkár, north of the two vast and undefined parganahs of Pharkiya and Chhaí of Sarkár Múngír; and now included in parganah Nisankhpúr Kora. The tradition is however a very vague one.

6. Aṭháís. Not found, and probably now known by some other name.

7 to 10. Basrí wa ghairah. Not found. I hazard the suggestion that we have under this name the present parganah of Nárí dígar on the north-east frontier of the Sarkár بسري may be a copyist's error for ناري and the Persian *dígar* is a commonly used equivalent for the Arabic *ghair.* This parganah is not otherwise traceable; but I do not attach much importance to the suggestion.

14. Piprá is a copyist's error for Babrá.

18. Bahnúr. There are several parganahs the names of which closely resemble each other, especially when written in Persian, such as Bahnúr, Bhanwar, Bhaur, Bhúrá, all of which would be written بهنور or بهور and in the Shikastah or even in the Naskh-ta'lík hand would easily be confounded. It appears that owing to this cause the names have been entered more than once, as *all* the mahals so named cannot be traced.

32. Pulwárá not found.

33. See remark on No. 18 above.

37. Búchháwar now Bachaur.

38. Barsání, properly Parsání. It is not now a parganah but merely a village in Babrá, the residence of the Rájás of Turki.

42. Tándah, not found.

44. Tirhut Haveli. This is the strangest entry of all. There is now no parganah called Tirhut, and there seems good reason for believing that there never was one so called. Tirhut (Sanskr. Tírabhukti) is the old name of the whole stretch of country from the Gandak to the Kosi, there is no evidence to shew that the name was ever restricted to a single mahal. Nor is there locally any tradition of there ever having been a Haveli Tirhut. The only two Havelis in the modern Tirhut region are those of Darbhanga and Hájipore. The latter is as we have seen duly recognized in the Aín, the former, however, appears merely as

a mahal without the addition of Haveli. It could only have acquired this title after the Rájás had moved their residence to that place from Bhawárá, an event which did not happen till 1762.

Although, however, there is not, and probably never was, a mahal called Tirhut, there is a very large parganah named Tirsaṭh ترسته, which occupies the centre of western Tirhut, just as Darbhanga does that of eastern. It seems more than probable that Todar Mal or his informant was misled by the similarity between the two words and wrote ترهت ترسته. The point is, however, an obscure one.

53. Sareshtá not found. Possibly a copyist's error, by which mahal Suresa of Sarkár Hajipúr has been repeated. Or it may be that a portion of that mahal was included in Sarkár Tirhut. There is a large tract of country opposite to Suresa on the Tirhut side of the Burh Gandak unaccounted for. It now bears the name of Kasmí, but this name does not occur in the Aín.

55. Salímabád. This very small mahal containing only one village is included in parganah Háví.

56. Sanjauli Tadra, not found.

58. Fakírábád, this is now written Fakhrábád فخراباد.

61. Kodá Khand. There is no parganah of this name, but I suspect that parganah Kab Khand is meant. The tract included in this parganah is surrounded on all sides by mahals of the Aín and it must therefore have been inhabited and assessed. The origin of the name is unknown to me, but if Kab = Kavi 'poet' it may have been equally correctly written Kav which would account for a spelling کورا changed by a copyist's error into کودا.

62. Korádí, an unmeasured mahal and probably not actually in the possession of the Muhammadans as it lies far to the north reaching to the base of the Himalayas and is now in Nepalese territory. I have merely underlined the name in the map as in the case of Puṇḍág and other outlying regions in Sarkár Bihár. The ancient city of Janakpur, the capital of Mithila, is in this parganah.

70. Noram. There is no mahal of this name. It is evidently a copyist's error for Loánw (نورم for لوام) लोआम् and लोआंव being equivalent. The origin of the name is not known to me, but it seems to point back to Lokagráma, Lohagráma or some such name. If it were not almost too far to the east to come within the area of the Ráma and Sítá legend I should think of Lavagráma from the name of Rám's son.

VII. SARKÁR RUHTÁS.

18 mahals. 473,340 b. 15 b. 40,819,493 d. Castes, various. 4,550 se. 162,000 foot.

1.	Álrah.	53,516 b. 16 b.	30,281,000 d
2.	Bhojpúr.	66,078 b. 17 b.	4 903,310 d
3.	Píro.		3,407,840 d
4.	Panwár.	22,733 b. 3 b.	1,677,000 d
5.	Baṛgánw.	10,540 b. 17 b.	842,400 d
6.	Jaunḍ.	45,251 b. 3 b.	4,440,360 d
7.	Jídar.	26,538 b. 16 b.	1,634,110 d.
8.	Danwár.	29,154 b. 4 b.	6,076,520 d.
9.	Dínár.		350,000 d
10.	Ruhtás Haveli.	34,330 b. 19 b.	2,258,620 d
11.	Ratanpúr. Has a strong fort.		783,425 d
12.	Sirsí.	44,710 b. 3 b.	2,769,466 d
13.	Sahasránw.	31,220 b. 18 b.	2,370,790 d
14.	Fathpúr Bihiá.	50,474 b. 15 b.	3,736,040 d
15.	Koṭrá.	29,168 b. 15 b.	18,293,200 d.
16.	Kot. Has a stone fort.		847,920 d
17.	Mangror.		924,000 d.
18.	Nannor.	26,921 b.	2,000,000 d.

This Sarkár is in the main conterminous with the modern district of Shahábád being bounded on the north by the Ganges, on the east by the Son, on the west by the ill-omened Karamnásá and on the south by the Kaimúr range, though in this direction it is impossible to say exactly how far it may have been held to extend in Akbar's time. The hold of the Muhammadans on this district must have been at all times somewhat precarious owing to the turbulence and independence of the Rájás of Bhojpúr. Dalpat Singh the Rájá in Akbar's days appears to have spent his time alternately in durance and in rebellion. A great deal of this Sarkár was doubtless in the words of Mr. Sarristahdár Grant "unsubdued "and probably unexplored as held by independant or refractory zamin-"dárs, though valued by information and entered on the public records of the exchequer."*

In the settlement made under Aurangzeb in A. D. 1685 it was broken up, as stated above, into two Sarkárs of which Rohtás contained 7 and the new Sarkár of Bhojpúr, or Shahábád (a name which apparently occurs for the first time at this period) contained 11.

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* Grant's Analysis. Fifth Report, p. 508.

Though in general comprised within the boundaries above mentioned the territory of this Sarkár breaks out in a curious way at one or two points. Mahal Fathpúr Bihiá includes the Doábá or tongue of land between the Ganges and Ghogra rivers which should geographically belong to Sarkár Gházipúr of Subah Ilahábád; but on the other hand mahal Chaunsá which from its position should form a portion of this Sarkár is given to Gházipúr.* In the present day this irregularity has been rectified, Chaunsá now belongs to Shahábád, and the Doábá to Gházipúr or strictly speaking to the recently formed district of Baliá in the North West Provinces.

Again in the south-east the parganas of Sírís and Kutumba which should by their position on the right bank of the Son, belong to Sarkár Bihár are attached to this Sarkár. Probably as lying within sight of the lofty fortified plateau of Rohtás they were more easily managed from there, than from the distant town of Bihár. (See No. 7 below.)

In the south-west also the parganah of Mangror lies beyond, that is, to the west of the Karamnásá and should belong to Gházipúr. It is now included in the district of Mirzapúr in the N. W. Provinces.

There is not much difficulty in reconstructing this Sarkár.

1. Álrah is evidently a mistake of the copyist for Árah or Arrah the present capital of the district.

5. Baṛgánw, a copyist's error for Bárahgánw, a still extant parganah at the extreme north-east corner of the Sarkár comprising most of the alluvial formations and islands at the junction of the Ganges and Son rivers.

6. Jaunḍ. Should be Chaunḍ. In the present day the name is usually written Chánd, and the area of this parganah is included in the modern one of Chainpúr. The name Chaunḍ is identical with Cháwand borne by several mahals in Sarkár Tirhut and is derived from Chámunḍá चामुण्डा, a name of Durgá, who according to a local legend destroyed a demon at this place.

7. Jídar. Should be Haidar (حیدر), and probably indicates the country on the right bank of the Son opposite Rohtás. There is a large fort called Haidargaṛh still extant in that region. It is now in parganah Jhapla. This parganah, together with Bilaunjah to the south-west, was assigned by Sháh Jahán along with Siris, and several others, for the maintenance of the garrison of Rohtás, and down to the time of British rule was included in that Sarkár.

11. Ratanpúr, this mahal together with Kot (No. 16) and Mangror (No. 17) comprised the district of Bijaygaṛh which passed into the possession of the Maharaja of Benares prior to British rule. We may

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* See Elliot's Races of N. W. P. vol. ii, p. 115.

probably therefore identify the "strong fort" mentioned in the Aín, with the well known hill-fort of Bijaygaṛh on a high plateau overlooking the Son. No place or tract bearing the name of Ratanpúr seems to exist in the present day.

12. Sírsí, now called Síris, a parganah in the Gya district on the right bank of the Son. It appears to have included also the modern parganah of Kutumbá which in Grant's Analysis is coupled with Siris in one zamindari, and included in Sarkár Rohtás.*

13. Sahasránw, now vulgo Sasseram, the home and burial-place of Sher Sháh, and his son.

15. Koṭrá appears to be the parganah now called Rámgaṛh, the village of Koṭrá is still extant in that parganah.

16. Kot. See remarks on No. 11. The fort of Kot appears to be that called Naugaṛh.

17. Mangror, now in the Mirzapúr district. I have treated this mahal together with Kot and Ratanpúr as being beyond the actual limit of Muhammadan possessions and have indicated them in the map by a coloured line under the name.

In conclusion, it will be seen that the reconstruction of this Subah is far from being complete. Here, as in the case of Subah Avadh, I would express a hope that persons living on the spot may be able to clear up some, if not all, of the doubtful points, by local enquiry.

* Fifth report, p. 515.

JOURNAL

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ASIATIC SOCIETY OF BENGAL.

Part II.—NATURAL SCIENCE.

No. I.—1885.

I.—*Fourth List of Butterflies taken in Sikkim in October*, 1884, *with Notes on Habits, &c.*—*By* LIONEL DE NICÉVILLE.

[Received 13th January;—Read April 1st, 1885.]

I have already contributed three papers to the Journal of this Society on the Rhopalocera taken near Darjiling in October. In the last of these papers, the number of species recorded as met with in this month is given as 284, which is increased in the present list to 313, or about twice the number of species found throughout the year in Calcutta. These species were all taken at low elevations, either in the Runjit Valley or on the roads between it and Darjiling, except in a few cases where other localities are given; and it is probable that many more species will be discovered when some of the other valleys and the higher elevations such as Sênchal come to be explored.

LEPIDOPTERA RHOPALOCERA.

Family NYMPHALIDÆ.

Subfamily SATYRINÆ.

285. *Mycalesis (Calysisme) blasius*, Fabricius.

A single male. In my previous paper,* I recorded that *M. perseus* was very rare in Sikkim. It appears that *M. blasius* is equally so, which accords with my lately expressed opinion that these hitherto supposed distinct species are in reality but one species, which should stand as *M. perseus*, the form that is usually called *blasius* occurring in the rains and the form *perseus*, in the dry weather. In the same way, *M. mineus* and *M. visala* must be united under the former name, the ocellated form (*M. mineus*) occurring in the rains, and the non-ocellated pointed-winged form (*M. visala*), in the dry season.

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* J. A. S. B. 1882, vol. li, pt. ii, p. 56, no. 136.

286. *Lethe scanda*, Moore.

Mr. Otto Möller took a single female specimen in perfect condition in Birch Hill Park, Darjiling, at 6,800 feet elevation. This sex has been twice separately described, by Mr. Moore as *Debis nada*, and by Mr. Druce as *Zophoessa dirphia*.

287. *Orinoma damaris*, Gray.

I took a single female specimen at 3,200 feet elevation. It differs from the male only in the wings being slightly broader, and the apex and outer margin of the forewing more rounded.

Subfamily MORPHINÆ.

288. *Stichophthalma camadeva*, Westwood.

I saw a single specimen of this splendid species. It is common in Sikkim in June and July.

Subfamily NYMPHALINÆ.

Symbrenthia hippocla, Cramer.

In the Proc. Zool. Soc. Lond. 1874, p. 570, Mr. Moore has described a species of *Symbrenthia* from Masuri under the name of *S. daruka*. I took a female specimen of a *Symbrenthia* on this occasion which I consider to be merely a casual variety or 'sport' of *S. hippocla*. It agrees with Mr. Moore's description of *S. daruka*, but has hardly any of the black ground-colour left, this varietal character being carried to even a greater extreme in it than in the specimen he described.

289. *Ergolis indica*, Moore.

A single male. This species is very doubtfully distinct from *E. ariadne*, Linnæus, which Mr. Moore has lately restricted to the island of Java.

290. *Limenitis danava*, Moore.

A single female taken at Singla, 1,000 feet elevation.

291. *Apatura sordida*, Moore.

One male taken in the Runjit Valley.

292. *Helcyra hemina*, Hewitson.

One female of this rare species.

Family LEMONIIDÆ.

Subfamily LIBYTHÆINÆ.

293. *Libythea myrrha*, Godart.

I took a single male in the bed of a hill stream.

Family LYCÆNIDÆ.

294. *Cyaniris marginata*, de N.

I took a single male at about 3,000 feet elevation.

295. *Nacaduba atrata*, Horsfield.

Three males.

296. *Nacaduba* prox. *viola*, Moore.

A single male. *N. viola* is recorded from Ceylon, but I have not seen a specimen from that locality. The expanse given for the ♂ is $\frac{9}{10}$ of an inch, while the Sikkim specimen measures $1\frac{3}{10}$ inches. The white bands on the underside as described by Mr. Moore appear to differ also: in *N. viola* the two inner and the outer ones are short; in the Sikkim specimen it is only the middle pair on either side of the discocellular nervules which are short, the other two pairs extending nearly across the wing.

Nacaduba ardates, Moore.

Mr. Distant in his recent work 'Rhopalocera Malayana' has divided the *Lycænidæ* into three groups, the first of which *(Curetaria)* lacks "filamentous tail-like appendages" to the hindwing, while the other two groups *(Castalaria* and *Aphnaria)* possess these tails. This year I took many specimens of a Lycænid in company with *N. ardates* which differed in no way from that species except in having no tails. On careful microscopic examination of these tailed and tailless forms, I can find no difference between them in respect of the venation; and as the markings are precisely similar, I conclude that they are one and the same species. Mr. Distant, in forming his three groups (p. 196), says that the presence or absence of the tail "may prove to be an uncertain and illusory divisional character" as an American naturalist has recorded that certain North American species have a tailless spring brood, and a summer tailed generation. In Sikkim, at any rate, both forms occur together, and in equal perfection as to condition. I have also received both forms from Orissa, collected by Mr. W. C. Taylor. Another species (*N. dana*, de N.) which when describing it I placed doubtfully in the genus *Nacaduba* has the venation of that genus, but no tails. It occurs at Buxa in Bhutan, in Sikkim, at Bholahât in the Malda district, in the Chittagong district, and at Ootacamund.

297. *Catochrysops bengalia*, de N.

One male.

298. *Sithon indra*, Moore.

One female.

299. *Sithon mandarinus*, Hewitson.

One male.

300. *Chliaria kina*, Hewitson.

I took a male only at about 3,000 feet elevation.

301. *Satadra atrax*, Hewitson.

Two females.

302. *Satadra bupola*, Hewitson.

Several examples. They differ from Hewitson's figure of that species in having an additional spot on the costa just beyond the spot closing the cell on the underside of the forewing.

303. *Satadra œnea*, Hewitson.

Three males and a female taken.

Family PAPILIONIDÆ.

Subfamily PIERINÆ.

304. *Delias belladonna*, Fabricius.

I took a single male at rest in the bed of a stream in nearly half an inch depth of running water.

Subfamily PAPILIONINÆ.

305. *Papilio (Sainia) protenor*, Cramer.

One male only.

306. *Papilio rhetenor*, Westwood.

Several males. This species has a male "sexual-mark" placed in a very unusual position, *viz.*, on the underside of the hindwing just beyond the cell between the third median and discoidal nervules.

307. *Papilio (Chilasa) panope*, Linnæus.

A single male.

Family HESPERIIDÆ.

308. *Badamia exclamationis*, Fabricius.

This is a common species in Sikkim, but met with in October for the first time on this occasion.

309. *Halpe cerata*, Hewitson.

This is rather a rare species.

310. *Suastus aditus*, Moore.

This species was first described from the South Andamans. Mr. W. C. Taylor has obtained it in Orissa.

311. *Coladenia dhanada*, Moore.

One specimen.

312. *Thanaos kali*, de N.

313. *Thanaos jhora*, de N.

These two species occur together with *T. stigmata* settled on damp spots sucking up the moisture. On the wing, *T. kali* is easily distinguished from the other two species by its much larger size and deep black colour. It is much the rarest of the three. *T. stigmata* is the only described species of the genus having a male sexual mark on the upperside of the forewing.

II.—*Notes on Indian* Rhynchota, No. 2.—*By* E. T. Atkinson, B. A.

[The notes are taken so far as possible from the original descriptions or from Stål, Signoret, Butler, or Distant, &c. where these writers have redescribed a species. The measurements of specimens not in the Indian Museum have been converted into millimetres from the recorded measurements of the several authors.]

[Received Feb. 17th ;—Read March 4th, 1885.]

HOMOPTERA.

Family Cercopidæ.

Cercopida, Stål, Hem. Afric. iv. p. 54 (1866) : Hem. Fabr. ii. p. 11 (1869). Fieber, Rev. Mag. Zool. (3 sér.) iii. p. 328 (1875) : *Cercopina* Stål, Ofvers. Kong. Vet. Aka. Förh. p. 718 (1870).

Frons convex or compressly produced : ocelli two on the vertex near the base : thorax, large, sexangular or trapezoidal : scutellum small or moderate, triangular ; tegmina usually coriaceous : feet remote from the sides of the body with the coxæ (especially the posterior pair) short : tibiæ rounded, posterior furnished with one or two spines and with a circlet of spinules at the apex.

Subfamily Cercopina,* Stål.

Cercopida, Stål, Hom. Afric. iv. p. 55 (1866) : Hem. Fabr. ii. p. 11 (1869) : *Cercopina*, Stål, Ofvers, Kong. Vet. Aka. Förh. p. 718 (1870).

Anterior margin of thorax straight, eyes equally long and broad.

In 1874, Mr. Butler of the British Museum (Cist. Ent. i. p. 245) recorded the species of the genera *Cosmoscarta* and *Phymatostetha*, formed by Stål from the genus *Cercopis* of Walker (*nec* Fabricius). He enumerated 104 species of the genus *Cosmoscarta* and 22 species of the genus *Phymatostetha*. Since then, the number of species of the genus *Cosmoscarta* has been increased by eight of which five, described by Mr. Distant, come from India and the Eastern Archipelago, and three, described by Mr. Butler, come from Penang and Sumatra. The number of species of the genus *Phymatostetha* has been increased by two, of which one comes from Ceylon and one from Assam; both have been described by Mr. Distant. The Indian Museum possesses about ten, apparently undescribed, species which may be referred to these genera, and which will form the subject of a separate paper hereafter.

Genus COSMOSCARTA, Stål.

Hem. Fabr. ii. p. 11 (1869): Ofvers. Kong. Vet. Aka. Förh. p. 718 (1870).

Frons very large, very tumid, obtuse, extended on the facial side almost to the eyes, devoid of any longitudinal furrow or keel.

1. COSMOSCARTA TRICOLOR, St. Farg. and Serv.

Cercopis tricolor, St. Fargeau and Serville, Enc. Méth. x. p. 605 (1825): Burm. Handb. Ent. ii. (i) p. 124 (1835): Walker, J. L. S. Zool. i. p. 95 (1856); *ibid.*, p. 165 (1857).

Cosmoscarta tricolor, Butler, Cist. Ent. i. p. 245 (1874): Distant, J. A. S. B. xlviii (2) p. 38 (1879).

Black, shining: head, thorax, scutellum towards the tip, hind borders of the abdominal segments, the tip of the abdomen and the legs, red: femora black, the four anterior red towards the tips: six red spots on each tegmen at the base. A Tenasserim variety in the Indian Museum differs from the type in having the subbasal fascia represented by a transverse series of four sanguineous spots; there is also a spot of the same colour at the base. It is thus intermediate between *C. tricolor* and *C. basinotata*, Butler (Cist. Ent. i. p. 245), which differs also in the coloration of the abdomen (*Distant*). Body long 22: exp. teg. 51 millims.

Reported from Borneo, Java, Singapore, and Tenasserim; a specimen from the last locality is in the Indian Museum.

2. COSMOSCARTA BASINOTATA, Butter.

Cosmoscarta basinotata, Butler, Cist. Ent. p. 245, t. viii, f. 2, (1874): Distant, J. A. S. B. xlvii (2) p. 194 (1878).

Form of *C. tricolor*: differs chiefly in having the tegmina crossed at the base by a patch of six red spots (that on the clavus being more or less bifid) instead of the pale testaceous band, and in the narrower and interrupted red bands margining the segments on the dorsum of the abdomen (*Butler*). Long. 21: exp. teg. 47 millims.

Reported from Sarawak, Tenasserim.

3. COSMOSCARTA MOOREI, Distant.

Cosmoscarta moorei, Distant, Trans. Ent. Soc. Lond. p. 321 (1878.)

Black, shining: tegmina with the base both above and below carmine. This coloration consists of a narrow straight subcostal streak of about 3 millims. in length and a broader claval streak of about the same length, gradually rounded and narrowed at its termination: wings fuscous; costal edge, for about half the length, narrowly tinged with carmine: eyes luteous: posterior border of scutellum, metanotum, and abdominal segments, apex and lateral borders of abdomen, carmine: anterior legs dull reddish, femora furnished with a strong spine; intermediate legs pitchy: mesosternum with two very large conical, thick teeth. Body long 13: exp. teg. 35 millims.

Reported from Sikkim.

4. COSMOSCARTA FUSCIPENNIS, St. Fargeau.

Cercopis fuscipennis, St. Farg. & Serv., Enc. Méth. x. p. 605 (1825.)

Cercopis plana, Walker, List Hom. B. M. iii. p. 653 (1851): J. L. S. Zool. i. p. 95 (1856): *ibid.* x. p. 276 (1867).

Cosmoscarta fuscipennis, Stål, Hem. Fabr. 2 p. 11 (1869): Butler, Cist. Ent. i. p. 246 (1874).

Black: head, chest, rostrum except its black tip, and the fore-border of the tegmina from one to two-thirds of its length, red: wings dark grey. Thorax sometimes with two black points. Body long 12: exp. teg. 27 millims.

Reported from Java, Penang, Mount Ophir, Malabar (*Walker*).

5. COSMOSCARTA MEGAMERA, Butler.

Cercopis nigripennis, Walker (*nec* Fabricius), List Hom. B. M. iii. p. 653 (1851).

Cosmoscarta megamera, Butler, Cist. Ent. i. p. 246, t. viii. f. 3 (1874): Distant, J. A. S. B. xlviii. (2), p. 38, (1879).

Form and general coloration of *C. fuscipennis* (St. Fargeau), but at once distinguished by its much greater size, black legs, the narrower reddish costal edge and less pronounced basal reddish diffusion on tegmina. The colour of the thorax and head also varies from piceous to castaneous and bright testaceous (*Butler*). Body long 16—19: exp. teg. 39—47 millims.

Reported from Hong-Kong, Laos, Java, Penang, Tenasserim, Silhat: the Indian Museum possesses specimens from Sikkim, Sibságar, Nága Hills, and Tenasserim.

6. COSMOSCARTA FUNERALIS, Butler.

Cosmoscarta funeralis, Butler, Cist. Ent. i. p. 247, t. viii, f. 4 (1874).

Form of *C. fuscipennis*, St. Far. & Serv., but thorax with a distinct central ridge: head and thorax dark castaneous; scutellum piceous, dorsum of abdomen reddish-orange; tegmina piceous, almost black; wings fuscous; pectus black; venter and legs red; segments transversely banded and laterally spotted with black; proximal extremities of femora blackish (*Butler*). Body long 20: exp. teg. 41 millims.

Reported from India.

7. COSMOSCARTA MASONI, Distant.

Cosmoscarta masoni, Distant, J. A. S. B. xlvii (2); p. 194 (1878): xlviii. (2), p. 40, t. ii, f. 6, (1879).

Pronotum stramineous with a quadrate black spot on the anterior margin: head (except basal portion), and eyes luteous: tegmina, pectus, legs, and abdomen shining black: prosternum with lateral borders stramineous: wings dark fuscous with the veins black ♀. Body long (excl. teg.) 17: exp. teg. 45 millims.

Reported from Burma, Tenasserim: type from the latter locality in the Indian Museum.

8. COSMOSCARTA VIRIDANS, Guérin.

Cercopis viridans, Guérin, Voy., Bél. Ind. Orient. p. 501; Atlas, t. 3, f. 7, 7a (1834): Walker, List Hom. B. M. iii. p. 654, (1851); J. L. S. Zool. x. p. 279, (1867).
Cercopis latissima, Walker, List Hom. B. M. iii. p. 655, (1851).
Cosmoscarta viridans, Butler, Cist. Ent. i. p. 249, (1874).

Black, shining: tegmina shining metallic blackish-green, convex along the fore-margin which is dilated towards the base; wings fuscous, veins black, rostrum, feet, and anus coccineous. Body long 15: exp. teg. 46 millims.

Reported from Coromandel, Java, Sumatra, Mysol, New Guinea.

9. COSMOSCARTA EGENS, Walker.

Cercopis egens, Walker, List Hom. B. M. Suppt. p. 171, (1858).
Cosmoscarta egens, Butler, Cist. Ent. i, p. 255, (1874).

Thorax and head black, shining: scutellum, metanotum, abdomen at the base and along the posterior margin of each segment, and the legs red: tegmina very red at the base and with a roseate band before the reticulated apical third, this band is sometimes narrow or indistinct or even obsolete: wings brown, rosy red at the base and along the adjoining part of the costa. Body long 11: exp. teg. 31 millims.

Reported from India, Penang: the Indian Museum possesses specimens from the Nága and Khasiya hills.

10. COSMOSCARTA DUCENS, Walker.

Cercopis ducens, Walker, List Hom. B. M. iii. p. 656, (1851): Stål, A. S. E. F. (4 sér.) v. p. 188, (1865).
Cosmoscarta ducens, Butler, Cist. Ent. i. p. 255, (1874).

Black, rostrum and legs piceous; abdomen shining violaceous; tegmina blackish-brown with two narrow, slightly undulating, sordid sanguineous bands; one, near the base; the other, at two-thirds of the length: wings dark brown, veins black. Body long, 16: exp. teg. 40 millims.

Reported from Silhat: the Indian Museum possesses a specimen from the Nága hills.

11. COSMOSCARTA LYDIA, Stål.

Cercopis lydia, Stål, Ofvers. Kong. Vet. Aka. Förh. p. 149, (1865).
Cosmoscarta lydia, Butler, Cist. Ent. i. p. 257, (1874).

Brick red or saffron-yellow: head, anterior part of thorax, scutellum (except the frena), tegmina, anterior lateral part of prostethium, metastethium, anus and tarsi, black: base of the tegmina brick-red or saffron-yellow: wings sordidly hyaline, apex very slightly infuscate, base palely saffron. Body long 8—10: exp. teg. 20—23 millims.

Sometimes tegmina have no saffron bands and sometimes have two, one before and the other behind the middle.

Reported from E. India.

12. COSMOSCARTA TRIGONA, Walker.

Cercopis trigona, Walker, List Hom. B. M. iii. p. 660, (1851).
Cercopis amplicollis, Walker, l. c. Suppt. p. 175, (1858).
Cosmoscarta trigona, Butler, Cist. Ent. i. p. 257, (1874).

Thorax metallic bluish-black, shining: borders of scutellum, posterior margin of segments of abdomen, the anus, coxæ and femora, and the tarsi at the base, red: tegmina bluish-black, tips brown, with a bifurcated basal streak and two bands, red; the basal streak with the median band contain between them an almost triangular patch, bluish black: the limb of the basal bifurcation on the hind border is much broader than that on the costal margin, neither quite reach the median band. Body long 10—12: exp. teg. 23—29 millims.

Reported from N. India.

The Indian Museum possesses specimens from the Khasiya and Nága hills, the Dhansiri valley, and Sibságar.

13. COSMOSCARTA DECISA, Walker.

Cercopis decisa, Walker, List Hom. B. M. Suppt. p. 175, (1858).
Cosmoscarta decisa, Butler, Cist. Ent. i. p. 258, (1874).

A second species described under this name by Walker (in J. L. S. Zool. x. p. 278, No. 296, 1867) has been renamed *C. zonata* by Butler (in Cist. Ent. i. p. 253, 1874). Walker describes *C. decisa* thus: "Black: head above and prothorax æneous-green, shining: prothorax with a very indistinct keel: tegmina whitish testaceous at the base and with two whitish testaceous bands; middle band almost equal in breadth and parallel to the basal one; exterior band contracted hindward: wings greyish-vitreous." Body long 7½: exp. teg. 17 millims.

Reported from Darjiling. The Indian Museum possesses a specimen from Sikkim.

14. COSMOSCARTA UNDATA, Walker.

Cercopis undata, Walker, List Hom. B. M. iii. p. 659, (1851): Stål, Ofvers. Kong. Vet. Aka. Förh., p. 148, (1865).
Cosmoscarta undata, Butler, Cist. Ent. i. p. 258, (1874).

Black: abdomen shining violaceous: thorax and the spots or bands on tegmina croceous or rufous-testaceous; an anterior transverse spot on the thorax and the posterior part, black: wings slightly infuscate, veins rufescent towards the base.

Var. *a*. Posterior half of thorax black: tegmina with almost the fifth basal part, posteriorly sinuated, a waved band a little before the middle, somewhat interrupted towards the claval suture, also a band beyond the middle, produced posteriorly in its middle, sometimes divided into three spots, rufous-testaceous. Body long 13: exp. teg. 30 millims.

This variety is reported from the Himálaya and the Indian Museum possesses specimens from Sibságar, Assam, and Arakan

Var. *b*. about the fourth basal part of the thorax, black: tegmina with a waved band before the middle, twice subinterrupted, emitting at the costal and scutellary margins a stripe, sinuated within, also with three spots disposed in a curved row beyond the middle, the two exterior often confluent, rufous-testaceous. Body long 9—10: exp. teg. 24 millims.

Reported from Penang.

15. COSMOSCARTA BISPECULARIS, White.

Cercopis bispecularis, White, A. & M. N. H. xiv. p. 426, (1844): Walker, List Hom. B. M. iii. p. 656, (1851): Stål, Stettin Ent. Zeit. xxii. p. 153, (1866).
Cosmoscarta bispecularis, Butler, Cist. Ent. i. p. 259, (1874).

Cinnabar, shining: thorax with two very large, nearly oval, black spots in front of which are two small, nearly round, black spots; pectus black; underside of abdomen with two black bands: tegmina with a short black stripe at the base, near which three united black spots form a curved band across the wing; another band is formed in the middle by three separate black spots; reticulated part at the tips brown; wings grey, red at the base, brownish along the hind borders and at the tips. Body long 11—12 exp. teg. 26—29 millims.

Reported from India, Almora, N. W. P., Penang: the Indian Museum possesses specimens from Assam.

16. COSMOSCARTA DORSIMACULA, Walker.

Cercopis dorsimacula, Walker, List Hom. B. M. iii. p. 658, (1851) : J. L. S. Zool. i. p. 95, (1856) : ibid. p. 165, (1857).
Cercopis quadrimaculata, Walker, l. c. p. 661, (1851).
Cosmoscarta dorsimacula, Butler, Cist. Ent. i. p. 259, (1874).

Walker's *Cercopis dorsimacula* in List Hom. l. c. p. 663, No. 41, is different and was renamed by him *Cercopis tomentosa* in J. L. S. Zool. x. p. 284, (1867) : it now stands as *Phymatostetha stellata*, Guérin (*q. v*).

Bright red shining: head with a short transverse streak along each side of the hind border; thorax with two very large black spots on each side of the disc and two smaller spots in front; pectus and abdomen towards the base, black: a row of black spots on each side of the abdomen, of which the underside, except the hind borders of the segments, is black; tegmina red with seven black spots, six large and more or less confluent form two curved bands; reticulated part lurid: wings lurid, red at the base; veins brown, red towards the base (*Walker*). Body long 12—14 : exp. teg. 36—39 millims.

Var. *a*. abdominal segments with black bands.

Var. *b*. Body and tegmina testaceous with the usual spots.

Reported from N. Bengal.

17. COSMOSCARTA FICTILIS, Butler.

Cosmoscarta fictilis, Butler, Cist. Ent. i. p, 259, (1874).

Allied to preceding but differs in its usually smaller size, narrower thorax, duller and more uniform colouring and much smaller and more regularly uniform black spots (*Butler*). Body long 12 : exp. teg. 32 millims.

Reported from Penang, India, Silhat.

18. COSMOSCARTA DORSALIS, Walker.

Cercopis dorsalis, Walker, List Hom. B. M. iii. p. 658, (1851).
Cercopis connexa, Walker, List l. c. p. 663, (1851).
Cercopis ramosa, Walker, Ins. Saunds. Hom. p. 85, (1858).
Cosmoscarta dorsalis, Butler, Cist. Ent. i. p. 260, (1874).

Walker describes *C. dorsalis*, thus :—" Piceous shining; shield very minutely punctured, impressed on each side in front; tibiæ and feet ferruginous; tegmina red, black on the reticulated part; eight large, partly confluent, black spots on membranous part: wings brown, veins black." Body long 9 : exp. teg. 25 millims.

Reported from N. India.

19. COSMOSCARTA PALLIDA, Walker.

Cercopis pallida, Walker, List Hom. B. M. iii. p. 657, (1851).
Cercopis ferruginea, Walker, List l. c. p. 660, (1851).
Cosmoscarta pallida, Butler, Cist. Ent i. p. 265, (1874).

Walker describes *C. pallida*, thus :—"Testaceous, head black, transversely striated, very convex in front: rostrum testaceous: abdomen brown, testaceous at the base, and at the tip: tips of the feet brown: tegmina lurid, brown towards the tips: wings grey, veins brown." Body long 11-13 : exp. teg. 29-33 millims.

Reported from India.

20. COSMOSCARTA ELEGANTULA, Butler.

Cosmoscarta elegantula, Butler, Cist. Ent. i. p. 265, (1874).

Allied to preceding: head and thorax metallic greenish black: abdomen purplish black, castaneous at the tip: tegmina piceous, veins of basal half testaceous: base and a transverse band at end of second third reddish-orange: wings slightly fuscescent; base rufescent (*Butler*). Body long 8 : exp. teg. 20 millims.

Reported from India.

21. COSMOSCARTA PICTILIS, Stål.

Cercopis pictilis, Stål, Ofvers. Kong. Vet. Aka. Forh. p. 249, (1854).
Cosmoscarta pictilis, Butler, Cist. Ent. i. p. 266, (1874).

Obscurely green chalybeous; scutellum on both sides at the base and at the apex weakly spotted with cinnabar: tegmina sordidly white, basal margin and two bands weakly cinnabar; two spots, one smaller before the first band and the other between the bands and the apex nigro-fuscous: femora red; tibiæ blackish. Long. 16; breadth of pronotum 6 millims. Butler writes that it seems allied to *P. signifera*, Walker from the description and in that case would be a *Phymatostetha*.

Reported from E. India.

22. COSMOSCARTA BOREALIS, Distant.

Cosmoscarta borealis, Distant, Trans. Ent. Soc. p. 321, (1878).

Head and pronotum luteous, antennæ black: abdomen and tegmina roseate, ocelli black, eyes luteous thickly covered with blackish markings: wings pale fuscous: pectus, coxæ, and femora luteous, fore and median tibiæ black, hind tibiæ luteous with the apex black: the tip of the rostrum, tarsi, and a strong spine near the apex of the hind tibiæ, black. Body long 6 : exp. teg. 17 millims.

Reported from the Khasiya hills.

23. COSMOSCARTA ANDAMANA, Distant.

Cosmoscarta andamana, Distant, Trans. Ent. Soc. p. 175, (1878): Waterhouse, Aids Ident. Ins. i. t. 58 (1880-82).

Sanguineous, finely and closely punctured: tegmina with a broad band across the middle and the apex broadly black: these bands are united at the inner margin, sometimes very broadly: wings sordidly hyaline with veins much darker, base slightly sanguineous: femora, tibiæ and tarsi piceous, hind tibiæ with an acute spine (*Distant*). Body long 9: exp. teg. 24 millims.

Reported from the Andaman Islands.

Genus PHYMATOSTETHA, Stål.

Ofvers. Kong. Vet. Aka. Förh. p. 721, (1870).

Frons tumid, seldom forming an angle below the middle, without a keel or longitudinal impression. Ocelli nearer each other than the eyes. Thorax with the posterior margin before the scutellum slightly sinuated posterior lateral margins straight or sinuated. Mesosternum furnished posteriorly with two conical tubercles. Feet moderate, posterior tibiæ armed with one or two spines.

24. PHYMATOSTETHA STÅLII, Butler.

Tomaspis circumducta, Stål (*nec* Walker), Ofvers. Kong. Vet. Aka. Förh. p. 150, (1865).
Phymatostetha circumducta, Stål l. c. p. 721, (1870).
Phymatostetha stalii, Butler, Cist. Ent. i. p. 267, (1874).

Blackish: frons, apices of the lobes of the vertex, apical and lateral margins of anterior part of the thorax, scutellum before the middle, two bands on the tegmina, equally removed from each other and from the base and the apex, the anterior small stripe on the corium, and the scutellary limbus of the clavus beyond the middle, sordidly lutescent: apical limbus of corium pellucid fuscous: wings fuscous, subsanguineous at the base: scutellum subequilateral; mesostethium with two distinct obtuse tubercles. Body long 14: exp. teg. 34 millims.

Reported from E. India.

25. PHYMATOSTETHA CIRCUMDUCTA, Walker.

Cercopis circumducta, Walker, List Hom. B. M. Suppt. p. 175, (1858).
Cercopis costalis, Walker, List, l. c. iii. p. 664, (1851).
Phymatostetha circumducta, Butler, Cist. Ent. i. p. 268, (1874).

The name *C. costalis* (*l. c.* iii. p. 664), had already been given to a local form of *C. theora*, White, by Walker (*l. c.* iii. 651) and was subsequently changed by him to *C. circumducta* for this species.

Black : head shining : frons with a semicircular luteous band which is prolonged in a conical form to the face which on each side is yellow : rostrum yellow, tip pitchy : prothorax with a luteous band along the fore border extending on each side to the base of the tegmina, scutellum lurid on each side ; pectus with large yellow marks on each side : abdomen purplish black with yellow bands at the tip, ventral surface yellow with three rows of transverse black spots, the side rows on the edge : legs tawny, femora and fore tibiæ brown, femora yellow beneath : tegmina dark brown with two narrow pale red bands, one at one-third, the other at two-thirds of the length, a yellow stripe extending along the fore-border from the base to the first band where it acquires a tawny hue, a pale red stripe extending along the hind-border from the base nearly to the first band : wings pale brown, almost colourless in part of the disc, luteous at the base, veins black (*Walker*). Body long 12 : wings long 15 millims. A variety has two subapical spots on the tegmina red.

Reported from Malabar, Singapore.

26. PHYMATOSTETHA HILARIS, Walker.

Cercopis hilaris, Walker, List Hom. B. M. iii. p. 665, (1851).

Phymatostetha costalis, Stål, Ofvers. Kong. Vet. Aka. Förh. p. 721, (1870).

Phymatostetha hilaris, Butler, Cist. Ent. i. p. 268, (1874).

Black : head shining ; frons with a semicircular luteous band which is prolonged in a very broad conical form and occupies the disc of the face : the latter is pitchy, sides and epistoma yellow, rostrum yellow with a black tip : prothorax with a luteous band along the fore-border, extending on each side to the base of the tegmen : pectus yellow, disc black : with 2—3 black spots on each side : abdomen purple, under-side yellow with three rows of transverse black spots, the side rows on the edge which is very broad : tegmina dark brown with two narrow yellow bands : the first at one-third of the length, interrupted on the disc and marked by some dots thence to the hind border ; the second, at two-thirds of the length, slightly waved : a yellow spot on the disc between it and the tip ; a yellow stripe extending along the fore border from the base to the first band : wings greyish, tinged with brown at the tips and along the hind borders, luteous at the base. Body long 10 : exp. teg. 25 millims (*Walker*). Stål, l. c. makes this a synonym of *C. costalis*, Walker.

Reported from Malabar.

27. PHYMATOSTETHA STELLATA, Guérin.

Cercopis stellata, Guérin, Icon. Règne Anim. Texte. p. 368, (1829-44) : Stål, Ofvers. Kong Vet. Aka. Forh. p. 150, (1865).

Cercopis dorsimacula, Walker, List. Hom. B. M. iii. p. 663, (1851) : J. L. S. Zool. i. p. 95, (1856).

Cercopis tomentosa, Walker, J. L. S, Zool. x. p. 284, (1867).
Phymatostetha stellata, Stål, Ofvers. Kong. Vet. Aka. Förh. p. 721, (1870) : Butler, Cist. Ent. i. p. 269, (1874).

Black, dull : head with a band in front of the eyes, two spots on the disc of the thorax, the lateral margins of the thorax, a spot on each side of the scutellum at the base, eight spots on each tegmen of which one is at the base, three are costal or subcostal, three near the hind-broader and one near the tip, luteous : narrow apical limbus, lurid : wings brown, rufescent at the base, veins black. Body long 17 : exp. teg. 37 millims.

Reported from Malabar, Malacca, Sumatra : the Indian Museum possesses a specimen from Johore.

28. PHYMATOSTETHA DORSIVITTA, Walker.

Cercopis dorsivitta, Walker, List Hom. B. M. iii. p. 662, (1851).
Var. *Cercopis humeralis*, Walker, List l. c. p. 662, (1851).
Phymatostetha dorsivitta, Butler, Cist. Ent. i. p. 269, (1874).

Black slightly shining : head red, black on each side in front and along the hind border : thorax with three red stripes, the side pair oblique and extending on each side from the fore border to the base of the tegmina; abdomen purple above, red at the tip and on each side : tegmina bluish brown with seven red spots, three costal or subcostal, three on hind border, and one on the disc near the tip which is lurid and occupies the apical fourth of the tegmen : wings pale brown, red at the base. Body long 18 : exp. teg. 42 millims.

Reported from N. India, Almora N. W. P., Silhat.

29. PHYMATOSTETHA PUDICA, Walker.

Cercopis pudica, Walker, Ins. Saunders. Hom. p. 84, (1858).
Phymatostetha pudica, Butler, Cist. Ent. i. p. 269, (1874).

Allied to *P. signifera*.

Reported from Silhat.

30. PHYMATOSTETHA SIGNIFERA, Walker.

Cercopis signifera, Walker, List Hom. B. M. iii. p. 655, (1851).
Tomaspis signifera, Stal, Ofvers. Kong. Vet. Aka. Förh. p. 151, (1865).
Phymatostetha signifera, Stål, l. c. p. 721, (1870) : Butler, Cist. Ent. i. p. 270, (1874).

Blackish : frons before the middle, lobes of the vertex, a median stripe of the thorax and anterior lateral margins, scutellum, almost third basal part of the tegmina, pectus, venter, and feet stramineous : the stramineous portion of the tegmina with three irregular brown spots; beyond these, two arched patches and a transverse patch and the apical limbus rufescent-testaceous, the transverse patch sometimes confluent with one of the arched patches situate near the posterior margin; wings fuscescent, base itself sordidly stramineous: narrow bands on venter, base and apex of tibiæ, black: abdomen above black-violaceous with small marginal spots and apex sordidly stramineous: femora with an obsolete fusco-testaceous stripe. Body long 10: exp. teg. 46 millims.

Reported from E. India: the Indian Museum possesses specimens from the Khasiya hills.

31. PHYMATOSTETHA DUBITABILIS, Walker.

Cercopis dubitabilis, Walker, List Hom. B. M. Suppt. p. 173, (1858).
Phymatostetha dubitabilis, Butler, Cist. Ent. i. p. 270, (1874).

Reddish testaceous, black beneath: head pale testaceous, vertex black posteriorly: prothorax black with a stripe on the disc and the posterior and antero-lateral margins, testaceous: scutellum black with a testaceous mark on the disc: abdomen above testaceous, posterior margins of the segments, red; tegmina red, testaceous towards the tips, with a black stripe which extends obliquely from the base to the middle of the interior border, is notched on the hind border, behind which there is a black streak, is connected in front with an oblique black streak, and is nearly connected with a more exterior oblique black streak which is dilated and angulated exteriorly and has there a black streak in front and is connected with a black spot hindward, wings grey with brown borders. Legs reddish, anterior femora and tibiæ striped with black (*Walker*). Body long 14: exp. teg. 33 millims.

Reported from Hindustan.

32. PHYMATOSTETHA PUDENS, Walker.

Cercopis pudens, Walker, List Hom. B. M. Suppt. p. 174, (1858).
Tomaspis pudens, Stål, Ofvers. Kong. Vet. Aka. Förh. p. 151, (1865).
Phymatostetha pudens, Stål, l. c. p. 721, (1870): Butler, Cist. Ent. i. p. 270, (1874).

Weakly sanguineous, black beneath; apical part of frons, band on vertex from eye to eye, clypeus, rostrum, two small spots on anterior margin of thorax, scutellum, base itself of tegmina, and five spots forming two rows, on the middle of each tegmen, disc above of the abdomen, pectus, venter, and feet, black: lateral limbi of prostethium and very narrow margins of venter, red: wings before the middle pale sanguineous, beyond the middle slightly infuscate: lateral margins of the anterior part of thorax slightly reflexed. Body long 20: exp. teg. 45 millims ♀.

Reported from Hindustan, Silhat: the Indian Museum possesses a specimen from Sikkim.

33. PHYMATOSTETHA BASICLAVA, Walker.

Cercopis basiclava, Walker, List Hom. B. M. Suppt. p. 172, (1858).
Tomaspis larinia, Stål, Ofvers. Kong. Vet. Aka. Förh. p. 152, (1865).
Phymatostetha basiclava, Stål, l. c. p. 721, (1870): Butler, Cist. Ent. i. p. 270, (1874).

Red or flavescent-testaceous: rostrum, two spots on vertex, two spots near anterior margin of thorax, apex of scutellum, a narrow, sometimes obsolete, stripe on tegmina from the base to one-third of length through the middle, abdomen above (except marginal spots and tip), pectus, and bands on the venter and feet, black: lateral limbi of prostethium, apices of coxæ and femora, yellow-testaceous: wings fuscescent, red at the base. Closely allied to preceding. Body long, 22: exp. teg. 52 millims. ♀.

Reported from India: the Indian Museum possesses a specimen.

34. PHYMATOSTETHA BINOTATA, Distant.

Phymatostetha binotata, Distant, Trans. Ent. Soc p. 323, (1878).

Piceous: head, face, lateral margins of prothorax, borders of tegmina and two rounded spots on the same (one placed a little above the claval suture, about one-third from the base, and the other midway, about one-third from the apex), pale sanguineous: scutellum black, narrowly bordered with red: abdomen, above, shining purplish black: eyes, legs, and body below black: wings fuscescent, narrowly sanguineous at the base (*Distant*). Long body 14: exp. teg. 35 millims.

Reported from Sadiya (Assam).

Genus CALLITETTIX, Stål.

Ofvers. Kong. Vet. Aka. Forh. p. 152, (1865): Hem. Afric. iv. p. 55, (1866).

Body elongate: frons variable in form: lateral margins of the anterior portion of the thorax straight, longer than those of the posterior portion: scutellum somewhat longer than broad: tegmina oblong or elongate, gradually somewhat amplified towards the apex: feet long, posterior tibiæ unispinose.

35. CALLITETTIX MELANOCHRA, Stål.

Callitettix melanochra, Stål, Ofvers. Kong Vet. Aka. Forh. p 152, (1865).

Lutescent, finely punctured: apical third of tegmina, apices of femora, anterior tibiæ (except the base), apical half of posterior tibiæ and tarsi, black: wings sordidly vinaceous: frons seen from the side produced downwards in a right angle furnished with a ridge continued from the base to the middle: wings sordidly vinaceous. Body long 8: exp. teg. 24 millims. ♀.

Reported from E. India.

36. CALLITETTIX PRODUCTA, Stål.

Callitettix producta, Stål, Ofvers. Kong. Vet. Aka. Förh. p. 153, (1865).

Black, very finely punctured; apex of scutellum, the tegmina, abdomen, and feet, reddish testaceous: frons tumid forming a nearly straight angle, rounded at apex, without a keel: thorax hardly broader than long, lateral margins of fore part a little shorter than the anterior margin: tegmina narrow, slightly amplified towards the apex. Body long 7: exp. teg. 16 millims. ♀.

Reported from E. India.

37. CALLITETTIX VERSICOLOR, Fabr.

Cicada versicolor, Fabricius, Ent. Syst. iv. p. 50, (1794): Syst. Rhyn. p. 69, (1803).

Callitettix versicolor, Stål, Hem. Fabr. ii. p. 11, (1869).

Black shining, fuscous-pubescent; tegmina with a spot before the middle of the clavus and a subtransverse spot on the corium placed between the middle of the corium and the base, white; two spots behind the middle of the corium, the external large, transverse; the internal small, obsolete, placed at the apex of the clavus, sanguineous: wings uncoloured, apical margin slightly infuscate. Body long with the tegmina 11½—12½: breadth of pronotum 3—3½ millims. ♀.

Reported from Tranquebar.

Subfamily APHROPHORINA, Stål.

Aphrophorida, Stål, Hem. Afric. iv. p. 55, 66 (1866): *Aphrophorina*, Stål, Ofvers. Kong. Vet. Aka. Förh. p. 722, (1870): Scott. E. M. M. vii. p. 2⁄1, (1871).

Anterior margin of thorax round or angular, eyes usually transverse; scutellum flat, triangular.

Genus PTYELUS, St. Fargeau & Serville.

Body very large: head somewhat narrower than the thorax or of the same breadth, short, anteriorly obtusely and roundly subangulated, entire anterior margin obtuse; frons slightly convex, transversely obsoletely sulcated, clypeus not extending beyond the apex of the anterior coxæ: ocelli almost equally distant from each other and from the eyes or a little more distant: thorax finely rugose, quadrangular, anterior margin broadly rounded: scutellum longer than broad: tegmina subcultriform, narrowed towards the apex, very densely punctured: apical area of wing behind the second anastomosis posteriorly acuminate, not reaching the intramarginal vein: posterior tibiæ bispinose.

I have not transcribed the descriptions of the following species attributed to *Ptyelus* by Mr. Walker as it is very doubtful whether they would be considered as belonging to it now and no representatives apparently exist in the collection of the Indian Museum.

38. PTYELUS CONIFER, Walker.

Ptyelus conifer, Walker, List. Hom. B. M. iii. p. 711, (1851).

Body long 6 : exp. teg. 17 millims. Reported from N. India.

39. PTYELUS QUADRIDENS, Walker.

Ptyelus quadridens, Walker, List Hom. B. M. iii. p. 711, (1851).

Body long 8 : exp. teg. 17 millims. Reported from N. India, N. Bengal.

40. PTYELUS SEXVITTATUS, Walker.

Ptyelus sexvittatus, Walker, List Hom. B. M. iii. p. 715, (1851).

Body long 5½ : exp. teg. 12½ millims. Reported from N. India.

41. PTYELUS PUNCTUM, Walker.

Ptyelus punctum, Walker, List. Hom. B. M. iii. p. 718, (1851).

Body long 5½ : exp. teg. 12 millims. Reported from N. Bengal.

42. PTYELUS SUBFASCIATUS, Walker.

Ptyelus subfasciatus, Walker, List. Hom. B. M. iii. p. 724, (1851).

Body long 4 : exp. teg. 8 millims. Reported from N. India.

Genus APHROPHORA, Germar.

Mag. Ent. iv. p. 50, (1821) : Amyot and Serville, Hist. Nat. Ins. Hém. p. 563, (1843) : Scott, E. M. M. vii. p. 271, (1870) : Fieber, Rev. Mag. Zool. (3 Sér.) iii. p. 382, (1875).

Head almost as broad as the prothorax : vertex almost horizontal and somewhat flattened ; anterior margin sometimes rounded, generally very obtusely angulated : clypeus of variable length, reaching to or beyond the first pair of coxæ : rostrum long, 2—3 jointed ; ocelli two or sometimes absent ; when present placed near the posterior margin of the vertex and more or less remote from the eyes. Pronotum hexagonal or trapezoidal with a longitudinal keel continued through the vertex ; anterior margin rounded or obtusely angulated, posterior margin frequently deeply angulate-emarginate, scutellum triangular, shorter than the thorax. Tegmina slightly coriaceous, ovally elongate, acuminate : wings with the inferior nerve furcate from the base or before the middle. Posterior tibiæ armed with 1—2 spines and a circlet of spinules at the tip.

43. APHROPHORA SIGILLIFERA, Walker.

Aphrophora sigillifera, Walker, List Hom. B. M. iii. p. 700, (1851),

Testaceous shining: head and thorax flat, with a slight yellow keel rudely punctured, thinly covered with tawny down: head above short mostly pitchy, slightly concave on the posterior margin, rather more convex in front; its length less than one-fourth of its breadth; face ferruginous, partly pitchy, slightly convex, with a very narrow yellow stripe which is most distinct towards the epistoma and is there traversed by two slightly curved yellow bands, one large, the other shorter and narrower; on each side, are about ten oblique, slightly curved transverse ridges: rostrum ferruginous with a pitchy tip: pectus with a short, broad, black band between the fore and middle legs: abdomen luteous, reddish on each side and beneath: legs ferruginous, spotted with yellow, hind femora yellow: tegmina lurid, thickly punctured, narrow and conical towards the tips which are almost acuminate, brownish along part of the fore-border, on each side of a large subquadrate whitish spot which is in the middle: wings almost colourless, veins black, tawny at the base (*Walker*). Body long 7: wings long 15 millims.

Reported from N. India.

Genus, CLOVIA, Stål.

Hem. Afric. iv. p. 68, 75 (1866): Ofvers. Kong. Vet. Aka. Förh. p. 723, (1870).

Head as broad as the thorax, rounded or roundly subangulated, varying in length, above flat, anterior margin of the lobes of the vertex acute, not furrowed; frons somewhat convex, clypeus moderately produced at the apex, not extending beyond the apex of the anterior coxæ: position of ocelli variable: thorax sexangular with the anterior lateral margins usually very short, parallel or very slightly diverging backwards, scutellum longer than broad: tegmina with the commissural margin beyond the apex of the clavus subangulated or a little rounded: posterior tibiæ bispinose (Stål).

44. CLOVIA GUTTIFER, Walker.

Ptyelus guttifer, Walker, List Hom. B. M. iii. p. 712, (1851).
Clovia guttifer, Stål, Hem. Afric. iv. p. 75, (1866).

Lurid: head and thorax flat, finely punctured, thickly tawny pubescent; head with a short yellow band and two black dots on fore-border; face yellow, with a flat, middle stripe, on each side of which are nine oblique very shallow ridges, spaces between them tawny; rostrum tawny with a black tip; abdomen luteous, pectus and legs yellow: tips of the spines and feet pitchy: tegmina ferruginous, thickly covered with tawny down, with two oblique whitish stripes on the fore-border near the tip where there is a black dot; first stripe broad, second very small, a black dot on the hind-border near the tip and a few whitish streaks along the veins: wings colourless, veins black, tawny towards the base. Body long $6\frac{1}{2}$: exp. teg. 15 millims.

Reported from N. Bengal.

45. CLOVIA NEBULOSA, Fabricius.

Cercopis nebulosa, Fabr., Syst. Ent. iv. p. 50, no. 14, (1794): Syst. Rhyn. p. 94, (1803).

Clovia nebulosa, Stål, Hem. Fabr. ii. p. 16, (1869).

Very pale yellowish-grey: two small median black spots on the head: tegmina obscurely fuscous, a very oblique anterior band, a somewhat large median spot varied with fuscous at the commissure, an obliquely transverse spot behind the middle of the costal margin and a minute costal spot towards the apex, yellowish grey: two narrow median stripes abbreviated before the middle and a lateral subtriangular spot on the thorax also lateral limbus of scutellum, fuscescent. Long with tegmina, 10; breadth of pronotum 3 millims.

Reported from E. India.

Genus CARYSTUS, Stål.

Berlin Ent. Zeitschr., vi. p. 303 (1862): Hem. Afric. iv. p. 69, 81 (1866).

Head as broad or almost as broad as the thorax, obtusely angulated; lobes of the vertex transversely impressed at the apex or furnished with a transverse ridge near the apex; frons slightly convex: rostrum short: thorax quadrangular or sexangular, in the latter case anterior lateral margins short: scutellum long, much longer than broad: tegmina membranous, pellucid, margined at the apex, obliquely roundly subtruncate at the apex: posterior tibiæ bispinose, upper spine sometimes very minute.

46. CARYSTUS VIRIDICANS, Stål.

Ptyelus viridicans, Stål, Ofvers. Kong. Vot. Aka. Förh. p. 251 (1854): Frog. Eug. resa, Hem. p. 286 (1859).

Carystus viridicans, Spangberg, Ofvers. Kong. Vet. Aka. Förh. No. 9, p. 13 (1877).

Weakly olive-green, below with the feet still weaker: vertex and thorax anteriorly weakly rufous-testaceous: tegmina olive-yellow, hyaline: spines of the posterior feet black at the apex.

Body long 5: breadth of pronotum 2 millims. Reported from Java, Malacca, Singapore, Tenasserim (?)

Subfamily MACHÆROTINA, Stål.

Machærotida, Stål, Hem. Afric. iv. p, 55 (1866): *Machærotina*, Stål, Ofvers. Kong. Vet. Aka. Förh. p. 727 (1870).

Anterior margin of thorax round or angular, eyes usually transverse: scutellum much elevated, compressed posteriorly, furnished with a long apical spine.

Genus MACHÆROTA, Burmeister.

Handb. Ent. ii. (i) p. 128 (1835).

Head small, frons tumid, confluent with the vertex, furrowed in the middle, elevated at the posterior margin, bearing the two ocelli which are approximate: basal joints of antennæ large, terminal setæ long, fine, curved: pronotum septangular, arcuate: scutellum larger, produced backwards with a median longitudinal groove which is continued into a long, pointed, acute upwardly, curved downwardly, sabre-like process: tegmina hyaline, with seven cells at the apex and a large middle cell surrounded by a forked vein: legs simple, hinder tibiæ and two first joints of the tarsi with a circlet of spinules.

47. MACHÆROTA ENSIFERA, Burmeister.

Machærota ensifera, Burm. Handb. ii. i. p. 128 (1835): Walker, List Hom. B. M. iii, p. 729 (1851): Stål, Ofvers. Kong. Vet. Aka. Förh. p. 727 (1870): Signoret, A. S. E. F. (5 Sér.), ix, p. xlviii. (1879).

Light yellow with the second and third segments above, the median part of the frons, a space on each side of the metanotum and the origin of the process, black: tegmina and wings hyaline, the base of the tegmina and the claval portion of the wings, fuscous: tegmina with five apical cells of which three lie towards the margin; above these, which gradually diminish in size, is a row of hyaline dots, on the margin itself: there are five brownish streaks on the prothorax of which the two median lateral ones are continued on the metanotum. Long 4 millims. ♂.

Reported from Philippines, Silhat.

48. MACHÆROTA SPANGBERGI, Signoret.

Machærota spangbergi, Signoret, A. S. E. F. (5 Sér.), ix, p. xlviii. (1879).

Yellowish brown; the median part of the frons, the tip of the abdomen above and the genital organs, black; feet brownish, posterior tibiæ yellow with the tips black. Differs from *M. ensifera* in having the frontal grooves black and the tegmina longer and less rounded at the tip. Long 4 millims. ♀.

Reported from Silhat.

49. MACHÆROTA PUNCTULATA, Signoret.

Machærota punctulata, Signoret, A. S. E. F. (5 Sér.), ix. p. xlix. (1879).

Brownish yellow, with the middle of the frons, the abdomen above (except the base), the feet (except the posterior tibiæ), and the frontal grooves, black; several transverse black spots on the thorax which is very finely punctured: metanotum brownish with two yellow, lateral, basal spots, the tip and the process blackish: tegmina elongate, five-celled and above the marginal two to three others smaller, very distinct: the hyaline nervures are spotted with several brown dots. Long 4 millims. ♀.

Reported from Silhat.

NOTE. *Cosmopsaltria abdulla*, Distant, noticed as No. 57 at page 226 of the Journal for 1884 is the same as *Cosmopsaltria spinosa*, Fabricius, No. 59. The Indian Museum possesses a specimen of *Cosmoscarta siamensis*, Butler, but the locality being uncertain, it has not been entered here.

III.—*On Observations of the Solar Thermometer at Lucknow.*—*By* S. A. HILL, *B. Sc., A. R. S. M., Meteorological Reporter North-Western Provinces and Oudh.*

[Received 23rd March 1885;—Read 6th May 1885.]

In the volume of this Journal for 1883,* I have discussed some observations of solar radiation made at Allahabad with the ordinary black-bulb maximum thermometer *in vacuo.* The conclusions drawn from these were that the absorbing power of the atmosphere is dependent upon the tension of aqueous vapour and the quantity of dust suspended in the air, pure dry air being very diathermanous; and that, when allowance is made for the variations of aqueous vapour, the mean results for the heating power of the sun during the years 1876—1882 exhibit a very uniform and gradual variation, culminating in 1878 and gradually decreasing afterwards, therefore presumably having an inverse relation to the number of spots on the sun's surface. The resulting variation is so regular in its character that, irrespective of its pointing to a conclusion regarding the sun's heat which is the reverse of that generally held by solar physicists, I have always looked upon it as doubtful, and probably due in part to some fortuitous combination of errors. I therefore intend on some future occasion, possibly after the end of the present year, when the position of the thermometer at Allahabad will be changed, to go over the figures again, taking a longer series of observations and making allowance for a cause of variation from month to month, namely, the elliptic form of the earth's orbit, which was neglected in the paper referred to. Meanwhile, I wish to lay before the Society the results of some other observations bearing on the same question, which tend to confirm the conclusions arrived at in my previous paper. To the method by which these results are attained, less exception can be taken, because they are in every case derived from several observations made on the same day under different degrees of obliquity of incidence, instead of upon the single record of a self-registering instrument.

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* Vol. li. Part ii.

Shortly after hourly observations on four days in each month were commenced at Lucknow, it was discovered that the solar thermometer in use at that station had ceased to be self-registering. A new instrument was therefore brought into use on ordinary days, but the old one was retained for the hourly observations. The records of all such observations of this instrument since the middle of the year 1876 have been filed, but for the purposes of the present paper I have used only those of the eight years 1877—1884 inclusive. At Agra, similar observations of a non-registering solar thermometer have been made for some years on hourly observation days, but, owing to a change of instrument, the register for the years 1877—1884 is broken. For this reason, and because the observatory at Agra is situated in the midst of the city, I have not thought it worth while to reduce the registers of that station, though they seem to confirm in a general way the results obtained from Lucknow.

Those parts of the Lucknow records which have been used for the purposes of the present paper are printed in Table I. The figures represent for each hour of observation the difference between the temperature of the black-bulb thermometer in the sunshine and the simultaneous temperature in the shade. Only those hours are given at which the sky was either quite free from cloud or at which the cloud proportion did not exceed 2-10ths of the expanse. In the months of July and August, very few clear days, thus defined, occur; consequently these months have been left out in drawing up the tables. For every other month in the eight years, except September 1878 and June 1880, there are some observations available.

TABLE I.—*Excess Temperatures of Insolation on clear, or nearly clear, days at Lucknow.*

	Hours of observation, Mean Time.								
	8	9	10	11	12	13	14	15	16
January, 1877...7th	23·9	43·3	51·0	52·1	56·1	...	...	42·4	29·1
14th	41·1	51·0	59·5	...	...	...	...	...	...
21st	41·5	52·5	57·5	60·7	57·8	56·6	53·6	50·1	40·1
28th	...	...	...	...	...	...	...	...	...
February.........7th	...	...	...	...	...	...	...	...	...
14th	42·0	53·8	55·0	57·3	62·8	57·7	55·3	46·4	42·1
21st	...	...	...	...	...	...	...	...	...
28th	44·0	54·1	58·8	59·4	59·6	58·9	55·8	51·1	45·4
March............ 7th	42·0	54·1	58·6	59·1	58·9	58·1	55·1	47·9	39·1
14th	38·1	52·1	58·1	56·1	54·6	54·1	52·6	...	...
21st	...	...	...	...	...	...	...	...	...
28th	...	...	...	...	...	56·1	52·9	49·6	41·9
April 7th	...	...	...	...	...	...	...	...	...
14th	47·1	53·6	57·6	58·1	57·1	55·0	52·8	...	...
21st	48·1	53·1	56·1	56·5	57·0	55·5	54·0	50·7	44·5
28th	...	...	...	...	...	...	...	...	...
May 7th	...	...	...	...	...	...	...	52·1	44·9
14th	...	55·8	55·8	57·0	56·0	57·0	54·5	49·5	42·0
21st	47·3	52·0	55·0	57·7	54·0	...	...	49·5	38·3
28th	40·3	48·3	53·0	57·0	58·0	54·8	55·0	50·0	41·8
June..............7th	...	...	...	...	...	...	...	...	...
14th	42·9	49·5	56·0	55·5	56·7	55·7	55·5	49·0	36·8
21st	38·8	50·0	55·0	...	...	...	...	41·0	35·0
28th	...	...	...	...	...	...	...	...	...
September...... 7th	...	45·9	53·1	...	57·3	...	...	...	...
14th	38·4	47·9	50·0	56·5	56·0	...	...	...	...
21st	40·9	47·8	49·3	51·8	53·8	...	..	...	...
28th	37·1	45·1	46·5	53·3	54·0	...	51·0	47·0	35·5
October......... 7th	...	...	...	...	...	...	...	...	...
14th	43·6	48·9	53·6	55·4	56·1	54·4	50·3	45·1	35·1
21st	38·1	43·6	46·4	48·1	50·1	48.6	...	...	32·1
28th	40·1	46·4	54·6	56·4	56·4	52.6	48·6	41·6	29·6
November 7th	...	...	...	...	...	...	...	...	...
14th	35·7	49·4	...	58·1	58·1	55·6	54·1	47·4	18·6
21st	...	44·1	51·4	56·4	57·9	57·6	50·4	44·3	20·3
28th	...	...	...	...	...	...	...	...	...
December 7th	...	...	...	...	...	...	...	...	...
14th	41·5	52·3	56·3	54·5	53·5	52·0	48·5	44·7	11·0
21st	39·3	47·0	...	...	...	48·0	40·8	32·8	12·3
28th	...	...	...	...	...	...	...	...	...

	Hours of observation, Mean Time.								
	8	9	10	11	12	13	14	15	16
January, 1878...7th	34·8	45·1	49·3	47·5	47·0	46·0	41·0	32·0	...
14th	...	...	...	...	...	...	...	...	...
21st	29·0	48·5	55·0	56·0	53·0	43·6	42·1	39·0	...
28th	...	...	...	...	...	...	...	...	...
February.........7th	...	...	...	...	...	...	...	...	...
14th	42·3	53·0	60·3	59·5	59·9	61·1	58·9	51·4	40·6
21st	...	...	...	...	...	...	...	...	...
28th	35·0	46·0	60·0	61·6	64·1	62·1	60·1	46·9	37·4
March............ 7th	45·5	57·1	60·1	61·9	66·1	65·1	60·1	46·1	39·1
14th	45·4	...	...	...	...	65·5	59·0	52·0	...
21st	...	...	...	...	...	...	...	...	...
28th	...	...	...	57·3	58·0	53·0	52·0	46·5	36·0
April 7th	...	...	...	...	...	...	...	...	...
14th	...	...	50·1	56·1	57·1	57·1	...	...	...
21st	48·1	55·1	61·0	...	...	...	...	...	...
28th	46·6	58·6	65·8	...	...	...	...	...	...
May 7th	...	...	...	...	...	56·6	52·0	44·8	33·0
14th	43·1	51·4	56·1	54·6	...	...	...	...	...
21st	...	...	...	...	...	60·1	57·0	53·6	...
28th	52·4	56·6	59·8	59·5	63·0	61·5	58·5	52·0	44·5
June...............7th	41·0	51·8	57·0	59·0	61·0	55·0	47·5	45·0	28·5
14th	48·8	51·0	55·5	56·0	...	...	...	43·0	32·5
21st	45·1	52·0	54·0	56·0	57·3	55·5	50·0	42·0	35·0
28th	...	...	...	...	...	...	...	...	...
September 7th	...	...	...	...	...	...	...	...	...
14th	...	...	...	...	...	...	...	...	...
21st	...	...	...	...	...	...	...	...	...
28th	...	...	...	...	...	...	...	...	...
October 7th	39·6	50·9	53·4	57·1	58·6	55·5	53·0	46·0	32·5
14th	37·1	47·1	54·1	58·9	59·4	58·6	57·0	47·0	44·1
21st	44·6	48·1	55·1	55·6	56·0	57·0	54·0	44·8	35·0
28th	39·5	47·6	52·4	55·9	54·9	52·6	50·6	31·1	24·9
November 7th	...	...	...	...	...	...	...	...	...
14th	...	...	...	...	...	...	...	...	...
21st	...	...	...	...	...	...	...	...	...
28th	35·5	47·5	50·1	52·6	54·9	55·1	48·6	40·1	29·9
December 7th	44·0	51·5	54·1	55·9	57·6	45·1	40·9	32·6	...
14th	37·1	40·0	47·5	49·1	49·4	46·4	43·6	37·6	...
21st	40·6	47·5	59·5	58·5	56·1	51·1	41·5	35·5	77·0
28th	...	...	...	...	...	...	...	...	...

	Hours of observation, Mean Time.								
	8	9	10	11	12	13	14	15	16
January, 1879...7th	30·1	46·8	55·0	...	...	...	...	...	...
14th	31·8	56·0	53·0	53·1	52·4	51·4	49·1	40·1	30·4
21st	36·1	55·5	57·0	59·6	55·4	47·6	44·4	38·1	28·6
28th	35·6	50·3	54·3	50·6	50·1	49·1	42·1	41·1	25·1
February......... 7th	41·7	...	59·5	55·1	52·1	51·4	43·9	44·1	40·1
14th	...	...	...	...	...	...	...	...	...
21st	45·0	48·9	60·1	56·4	55·9	54·6	53·1	...	45·1
28th	42·3	53·4	58·6	56·1	55·4	53·9	52·6	49·1	29·6
March 7th	...	...	...	57·6	56·6	54·6	...	...	44·6
14th	...	49·1	59·9	...	...	...	...	...	...
21st	52·6	56·1	63·1	62·1	61·1	58·1	54·9	48·1	41·9
28th	44·9	52·6	58·5	59·0	55·0	54·0	48·0	44·5	40·3
April 7th	47·1	50·8	59·5	60·8	62·8	62·8	59·6	...	...
14th	48·9	56·5	59·5	60·3	60·8	60·5	55·8	51·3	40·8
21st	...	...	...	...	...	...	...	...	...
28th	43·8	56·0	61·0	61·8	62·0	61·8	54·8	47·5	46·5
May 7th	44·1	53·0	57·0	55·0	58·3	57·5	55·5	48·5	38·5
14th	43·5	52·0	60·0	62·0	62·3	60·8	57·3	44·5	41·5
21st	...	...	...	...	...	...	...	...	...
28th	41·4	52·6	63·5	62·0	61·0	...	...	...	...
June............... 7th	36·1	45·9	56·0	55·0	56·0	47·5	42·5	...	...
14th	38·8	52·5	56·5	58·3	60·0	59·5	57·5	39·8	27·0
21st	...	...	...	...	...	...	...	...	...
28th	...	...	...	...	...	...	...	...	...
September 7th	...	...	...	...	...	...	...	...	...
14th	37·3	46·1	53·6	52·9	51·1	49·1	43·1	39·1	34·1
21st	...	...	...	...	...	...	...	...	...
28th	...	...	...	...	...	...	...	...	...
October 7th	...	...	...	...	...	...	...	...	...
14th	45·1	51·1	50·6	52·6	49·6	47·6	46·1	40·6	32·6
21st	41·1	55·6	59·1	59·9	56·6	50·1	46·1	36·1	28·1
28th	49·6	55·2	59·9	59·0	56·1	52·4	43·1	32·6	29·1
November 7th	39·3	54·2	58·7	59·4	53·6	46·1	40·1	36·8	21·4
14th	35·7	52·4	57·8	48·6	47·6	44·2	39·6	36·7	28·6
21st	45·5	53·4	56·5	49·2	45·6	41·4	38·8	34·2	24·9
28th	41·5	58·3	57·3	50·7	46·2	41·2	35·1	25·9	11·6
December 7th	37·9	55·5	59·7	49·6	48·4	46·6	42·3	35·9	7·4
14th	32·9	48·5	55·0	49·5	47·6	38·9	36·1	33·9	22·5
21st	36·0	44·5	56·5	52·6	47·1	45·1	41·4	32·2	18·9
28th	...	...	...	...	...	...	...	...	...

	Hours of observation, Mean Time.								
	8	9	10	11	12	13	14	15	16
January, 1880...7th	43·3	53·0	57·9	49·5	49·4	49·6	43·1	37·6	25·6
14th	36·6	50·7	54·8	49·7	50·6	47·6	43·6	37·8	32·0
21st	...	...	...	...	...	...	...	...	...
28th	...	...	...	...	...	...	...	...	...
February......... 7th	42·0	50·5	57·5	51·0	51·9	50·4	47·6	43·1	34·6
14th	...	...	...	...	...	...	...	...	...
21st	43·8	54·7	59·9	56·3	54·6	52·6	50·4	47·8	41·8
28th	38·1	57·4	61·0	56·6	54·5	52·0	49·1	44·1	37·6
March............ 7th	28·0	47·6	55·4	53·6	53·9	49·1	46·8	47·8	31·9
14th	33·6	49·4	58·1	56·0	54·8	52·8	49·8	44·8	34·8
21st	39·6	47·0	52·2	49·6	55·8	53·8	46·8	41·8	39·3
28th	38·6	47·6	54·1	55·8	56·6	53·8	52·0	51·3	43·3
April 7th	43·6	50·6	54·1	...	...	...	...	..	40·8
14th	...	...	...	...	...	...	...	...	...
21st	...	...	...	...	...	...	...	...	...
28th	...	...	...	...	53·0	50·8	52·8	47·8	40·6
May............... 7th	45·6	53·1	56·6	56·8	55·6	54·1	52·2	48·3	42·8
14th	...	...	...	...	...	...	...	...	...
21st	...	...	...	...	...	...	...	...	...
28th	38·5	49·3	51·8	52·8	52·8	54·8	54·8	51·2	42·8
June............... 7th	...	...	...	...	...	...	...	...	...
14th	...	...	...	...	...	...	...	...	...
21st	...	...	...	...	...	...	...	...	...
28th	...	...	...	...	...	...	...	...	...
September 7th	...	...	...	...	...	...	...	...	...
14th	...	...	...	...	...	...	...	...	...
21st	45·1	50·0	56·1	...	...	...	...	...	...
28th	...	...	...	...	...	...	...	...	...
October 7th	28·6	47·1	54·1	59·1	56·0	54·2	45·8	42·9	38·6
14th	41·4	49·9	57·6	59·6	58·8	58·6	55·8	52·3	...
21st	44·6	52·1	52·6	56·4	58·7	56·4	54·3	45·6	29·8
28th	46·6	53·6	62·6	62·9	66·6	62·7	59·7	51·6	...
November 7th	39·6	51·1	54·1	57·1	46·6	45·6	...	...	...
14th	42·0	50·5	53·6	53·6	46·1	45·6	46·6	39·1	28·6
21st	...	...	...	...	...	...	...	...	...
28th	...	52·8	56·8	53·1	50·8	50·1	41·9	36·4	23·2
December 7th	35·7	48·0	55·6	...	...	55·6	54·1	...	...
14th	36·0	46·5	...	...	56·6	47·0	...	34·6	25·6
21st	...	...	...	...	52·0	47·5	43·6	35·6	27·5
28th	36·6	46·3	65·1	56·1	49·6	...	...	...	27·1

	Hours of observation, Mean Time.								
	8	9	10	11	12	13	14	15	16
January, 1881...7th	...	...	...	49·8	53·5	56·7	49·9	46·6	28·0
14th	38·6	50·8	54·0	52·5	49·9	50·1	42·6	38·6	29·1
21st	34·6	51·5	59·0	57·0	54·1	52·9	48·8	41·1	31·9
28th	54·3	60·8	64·3	70·7	74·7	77·2	...	...	...
February 7th	37·5	52·5	55·5	53·6	54·6	54·6	53·1	47·6	39·6
14th	33·5	52·0	52·6	56·1	55·1	53·6	52·1	46·7	...
21st	...	...	...	...	...	...	...	...	...
28th	29·5	52·6	57·1	57·1	57·6	...	...	...	...
March............ 7th	...	...	...	...	...	...	...	...	...
14th	...	...	...	...	...	...	...	...	...
21st	45·5	55·8	59·1	...	...	...	...	...	...
28th	44·5	51·6	57·1	...	...	...	...	...	...
April 7th	...	...	...	...	...	...	...	...	...
14th	45·6	53·9	56·9	54·8	55·3	54·8	52·8	...	58·3
21st	40·7	48·0	55·1	56·1	55·9	55·3	51·9	...	43·8
28th	46·4	47·6	57·6	58·3	55·8	52·6	50·3	45·3	33·8
May............... 7th	40·1	47·6	52·8	53·8	54·3	53·3	49·8	44·8	36·2
14th	...	...	...	...	...	...	...	...	...
21st	37·5	47·8	52·3	53·6	55·3	54·6	53·6	...	...
28th	41·1	48·3	53·3	57·6	54·6	51·8	...	...	...
June 7th	32·3	39·3	42·3	...	...	...	...	...	...
14th	...	...	...	...	...	...	...	...	...
21st	...	...	...	...	...	...	...	...	...
28th	...	...	...	...	...	...	...	...	...
September...... 7th	...	...	...	...	...	...	...	...	...
14th	...	...	...	...	...	...	...	...	...
21st	...	...	...	...	...	...	...	...	...
28th	41·8	52·8	56·8	54·4	53·8	53·3	...	...	42·3
October 7th	...	...	...	...	...	...	...	...	...
14th	42·6	51·7	54·6	54·9	54·3	51·3	47·3	40·3	30·8
21st	48·6	52·6	53·8	51·8	53·3	51·3	43·6	35·3	29·1
28th	...	...	...	51·9	53·9	49·4	49·1	44·9	26·5
November 7th	...	...	...	...	...	48·1	45·1	38·6	22·1
14th	47·3	54·1	58·6	52·9	53·6	50·6	43·8	40·9	19·6
21st	42·9	51·3	55·6	56·6	54·1	49·6	43·7	38·1	26·6
28th	42·8	49·7	54·1	47·1	45·6	40·9	36·1	34·1	21·6
December 7th	35·5	48·8	52·0	52·4	52·9	47·9	43·4	31·6	21·4
14th	45·0	51·5	53·5	50·4	46·6	42·6	43·4	30·1	17·6
21st	29·8	50·0	55·5	50·1	47·6	43·6	32·1	27·6	17·6
28th	38·8	51·3	54·5	55·9	54·1	49·8	43·1	34·6	23·1

	Hours of observation, Mean Time.								
	8	9	10	11	12	13	14	15	16
January, 1882...7th	33·5	49·8	54·5	55·0	53·7	50·6	48·1	44·1	32·1
14th	35·3	38·2	52·5	55·5	55·5	51·0	45·9	41·4	...
21st	29·5	42·3	51·5	54·5	55·8	51·6	47·1	38·6	32·4
28th	42·5	44·5	55·6	57·6	...	49·4	...	38·4	33·1
February 7th	45·5	52·5	59·4	61·1	59·1	56·9	50·6	42·6	33·4
14th	...	...	...	...	...	49·6	44·4	39·9	28·4
21st	45·5	56·7	62·5	60·6	61·6	59·9	57·4	53·6	44·6
28th	31·5	48·1	61·1	56·6	56·6	55·1	52·1	46·9	37·6
March 7th	39·3	51·6	57·1	55·1	54·8	50·8	...	...	...
14th	...	...	...	...	...	...	...	...	...
21st	50·6	53·4	58·6	59·3	56·8	54·3	51·8	42·6	23·3
28th	40·6	48·8	55·6	55·9	57·8	58·8	53·8	47·3	39·6
April 7th	...	...	...	...	...	...	...	...	...
14th	45·6	53·6	56·8	59·8	59·0	54·6	52·8	48·3	41·3
21st	...	...	...	...	...	...	...	...	...
28th	44·2	53·0	58·3	59·8	56·6	51·8	49·3	46·8	40·3
May 7th	51·6	54·9	56·6	...	...	...	...	...	...
14th	...	...	...	...	...	...	...	...	...
21st	45·8	54·8	56·3	59·8	55·3	51·8	46·3	41·8	39·8
28th	...	...	...	...	...	...	...	...	...
June 7th	...	...	...	...	...	...	...	...	...
14th	...	...	...	...	...	...	...	...	...
21st	42·6	47·4	...	...	...	...	49·8	43·3	...
28th	...	...	...	...	...	...	...	...	...
September...... 7th	35·6	48·6	53·1	...	...	...	...	...	...
14th	...	...	...	...	...	...	...	...	...
21st	...	...	...	...	...	...	...	...	...
28th	52·1	52·4	52·1	47·8	50·8	50·8	46·3	40·8	30·5
October 7th	...	...	...	...	...	...	...	...	...
14th	37·6	46·6	51·1	51·1	49·8	44·3	40·3	32·5	26·8
21st	46·6	51·0	53·6	54·6	48·6	46·3	41·3	35·8	23·8
28th	39·9	49·6	50·4	49·9	48·1	42·6	39·1	36·6	18·6
November 7th	45·2	48·1	50·4	50·6	47·1	41·9	38·1	30·9	13·6
14th	40·2	45·1	51·9	50·3	45·6	41·6	37·6	30·9	15·1
21st	37·5	50·5	54·1	51·4	46·6	42·1	36·1	26·1	12·1
28th	...	...	...	...	...	...	...	...	...
December 7th	31·2	46·5	51·1	51·6	49·6	43·1	37·1	27·6	18·1
14th	35·3	45·5	48·6	47·6	44·9	41·1	36·1	26·1	18·6
21st	...	...	...	...	...	...	...	...	...
28th	43·5	55·5	55·5	54·6	51·1	45·6	37·6	27·1	15·6

	Hours of observation, Mean Time.								
	8	9	10	11	12	13	14	15	16
January, 1883...7th	27·8	40·8	47·0	48·4	...	...	...	...	...
14th	34·5	49·5	52·5	52·1	50·6	46·4	38·6	31·6	22·6
21st	...	...	...	...	...	...	...	...	...
28th	31·5	47·5	54·0	54·5	50·5	48·5	41·5	35·0	28·0
February 7th	41·1	50·8	55·0	56·0	54·5	48·6	43·6	39·4	31·6
14th	36·5	52·0	55·0	55·6	54·1	50·0	46·9	36·6	32·6
21st	37·5	53·5	54·4	54·9	53·1	50·1	46·1	...	...
28th	...	...	...	...	...	...	...	...	...
March............ 7th	...	...	...	...	...	...	...	...	...
14th	...	...	...	...	...	...	...	...	...
21st	34·6	46·6	55·6	55·6	56·1	52·1	48·9	41·6	...
28th	40·6	50·6	52·6	55·3	54·1	50·8	46·8	...	...
April 7th	43·6	53·6	55·1	56·3	54·3	50·8	46·8	41·3	39·8
14th	...	...	...	...	...	...	...	...	...
21st	48·2	53·8	56·1	55·8	55·6	54·3	48·1	44·3	37·8
28th	37·6	49·6	53·6	55·6	55·8	...	48·8	41·8	33·1
May............... 7th	43·8	50·8	54·8	55·8	54·8	52·3	47·8	45·3	36·8
14th	36·6	54·8	56·8	54·8	53·1	50·5	49·5	46·3	...
21st	30·6	43·6	44·8	48·8	55·6	56·3	49·8	44·8	31·8
28th	...	...	...	...	...	...	...	...	...
June 7th	36·1	50·8	53·8	55·6	52·8	49·8	46·3	46·8	36·8
14th	...	...	...	...	...	...	...	...	...
21st	...	...	...	...	...	...	...	...	...
28th	...	...	...	...	...	...	...	...	...
September 7th	44·1	48·6	...	...	54·8	51·8	47·8	...	...
14th	...	...	...	...	...	...	...	...	...
21st	...	...	...	...	...	...	...	...	...
28th	...	...	52·9	52·0	51·3	47·8	44·3	38·8	30·8
October 7th	...	...	...	...	...	...	...	...	...
14th	43·1	46·9	48·6	50·6	52·8	53·8	46·8	35·8	21·6
21st	50·6	53·8	53·6	53·4	53·1	55·1	48·4	45·6	28·6
28th	43·5	48·1	51·1	51·6	54·1	54·6	46·1	41·4	22·6
November 7th	...	...	...	...	...	...	...	...	...
14th	29·6	37·1	42·6	48·6	52·6	...	...	...	...
21st	32·5	41·5	53·5	52·1	56·6	58·6	...	...	...
28th	49·5	50·5	47·6	51·6	50·6	45·1	...	...	...
December 7th	...	40·5	40·5	44·4	45·1	45·6	36·1	22·6	...
14th	...	...	47·5	48·1	48·6	44·6	35·6	28·6	...
21st	...	52·0	53·5	62·0	60·6	47·6	35·6	22·1	...
28th	...	36·5	47·5	58·5	56·1	53·6	48·6	40·6	...

	Hours of observation, Mean Time.								
	8	9	10	11	12	13	14	15	16
January, 1884...7th	30·5	51·5	55·5	53·9	51·8	48·6	42·6	34·1	19·6
14th	50·6	53·5	52·5	46·6	40·6	35·6	29·6	27·1	18·6
21st	27·5	39·5	54·5	50·5	50 6	51·6	39·6	30·4	20·1
28th	22·5	31·5	...	47·8	53·8	50·9	50 1	45·6	...
February 7th	36·5	42·5	48·5	48·0	53·5	52·8	48·1	45·6	39·6
14th	29·5	35·0	38·6	43·6	47·4	52·6	50·4	44·6	24·6
21st	31·5	47·0	53·6	54·6	54·6	56·9	...	...	...
28th	...	...	48·6	50·3	51·6	53·8	49·8	...	...
March............ 7th	30·9	44·6	50·6	48·6	48·9	53·1	48·8	41·6	32·1
14th	...	...	...	...	...	...	...	...	...
21st	...	...	...	...	...	...	...	...	...
28th	52·6	58·6	58·8	61·8	61·8	62·8	54·3	48·8	40·8
April 7th	41·1	52·6	58·6	62·8	64·8	65·8	50·8	48·8	34·3
14th	43·1	52·3	46·8	47·8	48·8	49·8	50·8	49·8	46·8
21st	...	...	...	...	...	...	...	...	...
28th	46·6	56·6	58·8	58·3	57·8	54·6	52·6	46·8	38·8
May 7th	...	...	...	...	...	...	...	...	...
14th	51·8	55·8	55·8	54·8	54·8	45·6	40·8	37·8	35·8
21st	50·6	54·8	57.8	57·8	54·8	52·8	50·8	47·8	40·3
28th	48·8	54·7	57·7	55·7	53·8	51·8	42·8	37·8	35·8
June 7th	33·6	45·8	44·8	45·3	44·8	45·8	...	...	41·8
14th	...	...	...	...	...	...	36·8	35·8	25·8
21st	41·6	...	...	45·8	43·8	...	...	...	...
28th	...	...	...	...	...	...	...	...	...
September...... 7th	...	...	...	...	...	...	...	...	...
14th	...	...	...	...	...	...	...	...	...
21st	15·1	34·6	54·8	53·8	54·8	55·8	51·8	44·1	38·8
28th	...	...	...	...	...	...	...	...	...
October 7th	38·6	42·6	51·6	52·6	53·6	52·6	43·6	33·6	27·6
14th	40·6	47·6	51·6	53·4	50·6	49·6	45·6	34·6	28·6
21st	39·6	46·6	50·6	49·6	47·6	46·6	44·6	33·6	11.6
28th	39·6	47·6	51·6	50·6	45·6	41·6	38·6	24·6	9·6
November 7th	38·5	43·5	52·6	53·6	53·6	45·6	41·6	24·6	22·6
14th	35·5	47·5	50·6	49·6	47·6	45·6	44·6	28·6	12·6
21st	24·5	44·5	49·9	52·6	49·6	46·6	43·6	23·6	17·6
28th	39·5	41·5	48·6	48·6	50·6	49·6	47·6	48·6	14·6
December 7th	39·5	52·5	48·5	44·6	42·6	43·6	34·6	27·6	22·6
14th	43·5	52·5	48·5	51·6	45·6	40·6	24·6	9·6	7·9
21st	18·0	24·5	47·5	...	51·6	50·6	50·6	42·5	...
28th	...	...	...	...	...	...	...	...	...

The differences between the numbers given in the table depend primarily upon variations in the sun's incident heat and in the proportion of this which is absorbed before reaching the instrument, the latter being dependent upon the composition of the atmosphere and the obliquity of the rays. Minor causes of variation depend upon the instrument itself and the nature of its surroundings, and upon the reflexion of heat from cloud, haze, or dust particles in the air; the instrument being designed to receive rays coming from all directions and not parallel rays only.

As regards the instrument itself, if its thermal capacity be large, it will be sluggish in responding to any change in the incident radiation. This will cause the incident heat in the afternoon to appear greater than in the forenoon. The Lucknow observations are not appreciably affected with any error of this sort, since the thermometer is a small one with a bulb not much larger than a pea and a tube so fine in bore as to make it easy to estimate tenths of a degree Fahrenheit in reading it. It would, therefore, respond almost instantaneously to any change in the incident radiation, were it not that owing to friction in the narrow tube the mercurial column seems to rise and fall by slight jumps and starts. Observations made at equal hour angles before and after noon may be expected, however, when combined, to eliminate any error due to the sluggishness or *per saltum* action of the thermometer.

The effect of changes in the nature of the ground-surface beneath the instrument and in other objects in the vicinity cannot be readily eliminated. They have been reduced to a minimum, however, by placing the thermometer in the centre of an open space on a stand 4 feet high.

The antecedent probability that the variations in the absorptive power of the atmosphere must be very considerable is great, for, even if we have nothing else to go upon but the observations in Table I., these indicate that the total absorption is almost as great in June, when the incident rays at noon are nearly vertical, as in December, when the sun rises only 40° above the horizon. To estimate the absorbing power, it is necessary to make some assumption regarding the manner in which it varies with the thickness of the atmosphere traversed by the rays. The only simple formula yet proposed which gives results in fair accord with observations made on a clear day is that of Pouillet. This formula, it is true, applies in strictness only to radiation of one definite kind, because the atmospheric absorption is selective; and Langley[*] has shown, by a hypothetical example, that the approximate constancy of absorption indicated by applying the formula to observations made on the same day at the most various angles of obliquity may co-exist with an error of nearly 50 per cent. in the deduced coefficient. Nevertheless, since it is impossible in practice to apply the method of prismatic analysis to all the very numerous actinometric observations which are required to prove the constancy or otherwise of the sun's radiation, and since the results of such an analysis must necessarily be vitiated to some extent by the selective absoption of the prism, some simple formula must be used and that of Ponillet is the best hitherto suggested. Even if the atmospheric absorption and consequently the radiation before it enters the atmosphere, as determined by this formula, be both much less than they ought to be, their variations from day to day or from month to month deduced by means of the formula must be in the same direction as they are in reality.

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[*] Zeitsch. d. Oest. Gesellsch. für Met., B. xx, S. 86.

Ponillet's formula is $r = Ap^e$, where r is the observed heating effect, A the effect undiminished by atmospheric absorption, p the diathermancy or transmission coefficient, and e the thickness of the atmosphere traversed by the rays. Table II. gives the values of e which have been employed in reducing the Lucknow observations. They have been calculated to a first approximation only, that is to say, they are equal to the secants of the sun's zenith distance at the hours of observation.

TABLE II.—*Atmospheric Thickness at Lucknow, Latitude 26° 50′ N.*

Date.	Hours of observation, Mean Time.								
	8	9	10	11	12	13	14	15	16
January 7th	4·44	2·52	1·89	1·62	1·53	1·59	1·81	2·33	3·86
14th	4·38	2·40	1·85	1·58	1·50	1·54	1·75	2·23	3·38
21st	4·29	2·43	1·81	1·55	1·46	1·50	1·69	2·13	3·23
28th	4·15	2·34	1·75	1·49	1·41	1·44	1·62	2·01	3·06
February 7th	3·79	2·21	1·62	1·43	1·35	1·38	1·54	1·89	2·80
14th	3·55	2·12	1·61	1·38	1·30	1·33	1·47	1·81	2·61
21st	3·25	2·00	1·54	1·33	1·25	1·28	1·42	1·74	2·48
28th	2·99	1·89	1·47	1·27	1·20	1·23	1·36	1·66	2·34
March............ 7th	2·71	1·78	1·40	1·23	1·17	1·20	1·33	1·61	2·25
14th	2·51	1·69	1·34	1·19	1·13	1·17	1·29	1·57	2·17
21st	2·34	1·63	1·31	1·16	1·10	1·15	1·27	1·55	2·11
28th	2·19	1·55	1·26	1·12	1·08	1·11	1·23	1·49	2·04
April 7th	2·03	1·47	1·21	1·09	1·05	1·09	1·21	1·45	1·97
14td	1·93	1·42	1·18	1·07	1·04	1·07	1·19	1·43	1·93
21st	1·86	1·39	1·16	1·06	1·03	1·06	1·17	1·41	1·89
28th	1·80	1·36	1·14	1·04	1·01	1·05	1·16	1·39	1·86
May 7th	1·74	1·33	1·13	1·03	1·01	1·04	1·15	1·38	1·82
14th	1·71	1·32	1·12	1·03	1·00	1·04	1·15	1·36	1·79
21st	1·69	1·31	1·12	1·03	1·00	1·04	1·14	1·35	1·77
28th	1·69	1·31	1·12	1·03	1·00	1·03	1·13	1·34	1·74

Date.	Hours of observation, Mean Time.								
	8	9	10	11	12	13	14	15	16
June 7th	1·69	1·31	1·12	1·03	1·00	1·03	1·13	1·32	1·70
14th	1·70	1·32	1·12	1·03	1·00	1·03	1·12	1·31	1·69
21st	1·71	1·33	1·13	1·03	1·00	1·03	1·12	1·31	1·68
28th	1·72	1·33	1·13	1·03	1·00	1·03	1·12	1·30	1·66
September...... 7th	2·02	1·47	1·22	1·11	1·06	1·11	1·23	1·50	2·06
14th	2·06	1·50	1·24	1·13	1·08	1·13	1·27	1·56	2·20
21st	2·11	1·55	1·27	1·15	1·10	1·16	1·31	1·63	2·34
28th	2·17	1·56	1·29	1·17	1·13	1·20	1·36	1·71	2·53
October 7th	2·32	1·64	1·36	1·23	1·19	1·26	1·45	1·85	2·86
14th	2·37	1·68	1·38	1·25	1·22	1·30	1·49	1·92	3·04
21st	2·48	1·63	1·43	1·29	1·26	1·34	1·56	2·02	3·31
28th	2·60	1·80	1·47	1·33	1·30	1·39	1·62	2·13	3·60
November 7th	2·84	1·92	1·56	1·40	1·37	1·47	1·72	2·30	4·06
14th	3·04	2·01	1·62	1·46	1·42	1·52	1·79	2·40	4·33
21st	3·23	2·04	1·68	1·50	1·46	1·56	1·84	2·48	4·58
28th	3·45	2·19	1·73	1·54	1·50	1·59	1·88	2·53	4·69
December 7th	3·81	2·32	1·81	1·59	1·54	1·63	1·91	2·57	4·73
14th	4·06	2·40	1·85	1·62	1·56	1·64	1·92	2·55	4·64
21st	4·30	2·47	1·88	1·63	1·56	1·64	1·90	2·50	4·42
28th	4·45	2·51	1·89	1·63	1·56	1·62	1·87	2·44	4·19

In making reductions of actinometric observations it soon becomes evident that the atmospheric absorption varies not only from day to day, but frequently from hour to hour. In nearly every month it seems to be greater at Lucknow in the afternoons than in the forenoons, as might be anticipated from the disturbances caused by diurnal heating, evaporation, and the quantity of dust stirred up in dry weather by the diurnal winds. Besides this general and regular increase from forenoon to afternoon, there are numerous irregular changes from hour to hour, which render it very difficult to estimate fairly the true absorbing power and the incident heat. For example, if the absorbing power happens to be greater about noon than in the morning or evening, the curve representing the variation of the observed heating effect will be flatter than it should be, and the deduced value of the incident radiation will be too low; whereas, if the absorbing power be least about midday, the deduced solar constant will be too high.

To reduce errors of this kind to a minimum, I have, wherever the series of observations for the several days of a month were complete or nearly complete, taken the mean for each hour, and then deduced the constants A and p of the formula from these mean values. In other cases, I have made a graphic representation of the logarithms of the observed radiation on a scale the abscissæ of which represented the values of *e*; and any observation which fell wide of the straight line indicated by the formula has been rejected.

Proceeding in this way, I have arrived at the following probable mean values of the solar radiation undiminished by absorption, and of the absorbing power of the atmosphere for vertical rays. The latter are the values of (1—*p*) when *p* is defined as above.

TABLE III.—*Mean Values of the Constant of Solar Radiation in Degrees of the Black-bulb Thermometer.*

Year.	Jan.	Feb.	March	April.	May	June.	Sept.	Oct.	Nov.	Dec.	Mean of all months.	Mean of Eight months.*
1877 ...	76·1	78·2	72·7	73·3	80·4	86·6	77·6	79·8	91·1	85·5	80·1	79·6
1878 ...	78·5	90·8	88·3	85·0	92·4	95·8	?	85·4	84·6	79·2	86·7	85·5
1879 ...	76·7	77·6	80·1	92·7	99·2	85·9	77·1	74·6	71·2	69·4	80·4	80·2
1880 ...	73·2	78·6	83·3	75·9	80·6	?	80·7	79·1	68·3	70·7	76·7	76·2
1881 ...	72·4	74·0	78·1	72·2	85·7	77·5	73·9	73·6	67·6	71·7	74·7	74·4
1882 ...	75·2	79·5	78·8	81·9	78·8	73·4	70·6	68·8	67·5	71·3	74·6	75·2
1883 ...	74·4	73·0	76·6	80·9	77·8	79·7	74·9	74·9	76·1	75·7	76·4	76·2
1884 ...	74·7	74·0	74·6	82·5	82·0	77·6	77·6	73·8	78·7	76·4	77·2	77·1
Mean	75·2	78·2	79·0	80·6	84·6	82·4	76·1	76·2	75·6	75·0	78·3	78·0

TABLE IV.—*Coefficients of Atmospheric Absorption for Vertical Rays.*

Year.	Jan.	Feb.	March	April.	May.	June.	Sept.	Oct.	Nov.	Dec.
1877	·175	·194	·188	·216	·294	·342	·272	·269	·268	·255
1878	·260	·264	·269	·266	·354	·407	?	·274	·251	·230
1879	·212	·199	·226	·324	·390	·358	·312	·232	·191	·201
1880	·179	·211	·317	·265	·306	?	·256	·259	·187	·160
1881	·201	·194	·230	·255	·360	·377	·218	·233	·175	·205
1882	·199	·218	·258	·295	·302	·311	·231	·240	·228	·224
1883	·222	·224	·278	·316	·306	·319	·277	·235	·223	·216
1884	·241	·243	·245	·251	·277	·324	·272	·368	·274	·267
Mean	·211	·218	·251	·279	·326	·333	·262	·251	·225	·220

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* June and September being left out.

From Table III., it appears that the variation of the solar heat from year to year has been similar to that deduced from the Allahabad observations, while the range indicated is even greater. The highest annual mean is that for 1878, when the sun spots were at a minimum, and the lowest, that for 1881 or 1882, when the spots were probably at a maximum.

Such a very distinct variation in the sun spot period must, I think, be the effect of a real variation in the emission of solar energy, but the great range of the observed inequality is probably due in part to other causes. It is evident from the means at the foot of Table II. that all the terrestrial causes of variation have not been eliminated, for, whilst these means are nearly constant for the months of September, October, November, December, and January, they are much more variable and considerably greater in the dry hot months of the year. If the excess temperature of the solar thermometer above that of the air were a true measure of the solar radiation, it should, when the observations are corrected for atmospheric absorption, give somewhat lower results for May and June than for December and January, on account of the greater distance of the sun in the former months. The opposite variation which is observed must be due to heat reflected from the bare hot ground and from the dust particles suspended in the air.

Since the bareness and hardness of the ground-surface under the instrument and the quantity of dust in the air are due to the same cause, and increase *pari passu*; it is, perhaps, justifiable to assume that the increase of the observed effect which is due to reflexion may be taken proportional to the quantity of dust. That is to say, we may put $A = \frac{S}{r^2}(1 + ad)$. In this formula A represents the mean value for any month at the foot of Table III.; S, the value this mean would have if the ground were moist and grassy, the air free from dust, and the earth at its mean distance from the sun; r the radius vector of the earth at the middle of the month; d the proportion of dust in the air; and a a coefficient which remains to be determined. The proportionate numbers for dust which I have assumed are:—

Jan.	Feb.	Mar.	Apl.	May	June	Sept.	Oct.	Nov.	Dec.
8	5	7	9	10	6	0	0	1	2

These differ somewhat from those already adopted for Allahabad, but, perhaps, represent the facts more justly. By means of the formula, with these values for d, we find:—

$$S = 73{\cdot}0^{\circ}$$
$$a = {\cdot}0157$$

In the month of May, therefore, the observed radiation is 15 or 16 per cent. greater than it would be if the ground were grassy and the air free from dust, other things being the same.

It follows from this that in a dry year the solar thermometer will give higher indications than in a damp one when due allowance is made for variations in atmospheric absorption. There can be little doubt that part of the great excess of the results for the latter half of 1877, the whole of 1878, and the first half of 1879, above those for subsequent years, is due to this cause; which is still better illustrated by comparing the months of March, April, and May, 1877, with the same months of 1879. In the former year the spring months were unusually showery, and, in consequence of this, the ground-surface was covered with grass, whilst in 1879 no rain fell and the ground was quite bare and dusty.

The conclusion to be drawn from this investigation seems to be that, while the results indicate a rather strong presumption in favour of the hypothesis that the emission of solar heat varies inversely with the number of sun spots, the hypothesis can only be definitely proved by observations of some kind of actinometer which is protected from reflexion and receives direct solar rays only. Probably, the form of instrument which will be found most useful is a thermopile turned by clock-work so as to face the sun and attached to a reflecting galvanometer by means of which the heating effect can be photographically recorded.

The absoption coefficients given in Table IV. are least in the cold weather months and greatest in the hot season and the rains. Since these coefficients are dependent upon the constitution of the atmosphere, it may be assumed, as it has been in my previous paper, that the constant p of Ponillet's formula is the product of three factors, α^b, β^f, and γ^d, where b is the barometric pressure, f the pressure of vapour, and d the proportionate number for dust. In strictness, b should stand for the pressure of the dry air only, but as the aqueous vapour thins out about three times as fast on ascending as it would do on the hypothesis of an independent vapour-atmosphere the pressure of the dry air is not $(b—f)$, as some suppose, but something very little less than b.

The mean values of the barometric pressure and tension of vapour observed at noon in the days given in Table I., are the following:—

	Pressure.	Vapour Tension.
January	29+ ·714 in.	·304 in.
February	·660	·281
March	·529	·374
April	·415	·406
May	·293	·568
June	·171	·674

	Pressure.	Vapour Tension.
September	·341 in.	·779 in.
October	·546	·464
November	·669	·335
December	·709	·268

By inserting these figures and those for dust above given in the formula, $log\ p = b\ log\ \alpha + f\ log\ \beta + d\ log\ \gamma$, it is found that the most probable values of the constants are:—

$$\alpha = \cdot 99518$$
$$\beta = \cdot 78091$$
$$\gamma = \cdot 98924$$

These results, while confirming those already arrived at, indicate that the absorption of solar radiation by dry air is greater than I have hitherto supposed, though not nearly so great as the absorption by water vapour.

IV.—*List of the Butterflies of Calcutta and its Neighbourhood, with Notes on Habits, Food-plants, &c.*—*By* LIONEL DE NICÉVILLE.

[Received 15th October;—Read 3rd December, 1884.]

In the 'Entomologist's Monthly Magazine,' 1882 vol. XIX, p. 33, there is a paper by Mr. G. A. J. Rothney, entitled, "A list of the Butterflies captured in Barrackpore Park during the months of September, 1880, to August, 1881." In this list, however, only 98 species are mentioned, which probably all occur in Calcutta, the two places being but 14 miles apart, and both situated on the low-lying deltaic banks of the Hughli. I have accordingly included all those of Mr. Rothney's species which I have not myself met with in Calcutta, distinguishing them by an asterisk prefixed to the serial number.

One of the most interesting points to which my attention has been drawn in these butterflies is the occurrence of seasonal dimorphism, there being in several species an ocellated form which occurs only in the rains, the cold and dry seasonal being non-ocellated. The constancy of this phenomenon is such that I cannot help thinking there must be some physical reason for it, can it be a protective one? The difference in the garb of the surrounding vegetation makes it little remarkable that a change should be found in the coloration of the butterflies of the two seasons, but it is difficult to see why this change should show itself in the obliteration or development of ocelli. The only hypothesis which I can suggest is, that during the rains the density of the vegetation is such that the butterflies can easily hide their conspicuous ocelli, while in the cold and dry seasons the ocelli, easily seen through the scantily-clothed jungle, would render the butterflies an easy prey to their inveterate enemies the birds, lizards, and insectivorous insects; so that the ocellation being a cause of danger would have a worse chance of survival, and consequently would be gradually wiped out by a process of a survival of the fittest, the fittest in this case being the least gaudily-marked individuals. Were this the case, however, the non-marked forms would certainly survive during the rains, for their homeliness of coloration, though no longer absolutely essential, would still give them an advantage over their ocellated brethren, unless indeed the ocelli are preserved by sexual selection at this time when the struggle for bare existence is not so keen as at other seasons.

Suborder RHOPALOCERA.

Family NYMPHALIDÆ.

Subfamily DANAINÆ.

* 1. DANAIS (PARANTICA) AGLEA, Cramer.

I have never met with this species, Mr. Rothney records it as 'rare.'

2. DANAIS (TIRUMALA) LIMNIACE, Cramer.

Very common everywhere at all seasons.

3. DANAIS (LIMNAS) CHRYSIPPUS, Linnæus.

The commonest butterfly met with here as elsewhere.

4. DANAIS (LIMNAS) ALCIPPOIDES, Moore.

A single individual has been taken in a garden at Ballygunj in March. Since the first volume of 'The Butterflies of India' appeared, I have received single specimens of this erratic species from Fyzabad in Oudh, from Bholahát in the Malda district, and from Khurda, Orissa. I have no doubt in my own mind that *D. alcippoides* is a casual variety, aberration, or "sport" of *D. chrysippus*, which would almost certainly be proved to be the case by breeding from a batch of eggs laid by a female *D. alcippoides*, when I should expect to find all, or nearly all, the resultant butterflies of the true *chrysippus* form.

5. DANAIS (SALATURA) GENUTIA, Cramer.

Almost as common as the preceding.

6. DANAIS (SALATURA) HEGESIPPUS, Cramer.

Decidedly a rare species, I have only seen seven specimens in all, five taken by myself in the two last months of three successive years, one taken by Mr. W. Doherty also in the cold weather, and one in March in a garden at Ballygunj; all these specimens, except the last, were taken in the Sealdah district. This species is exceedingly common in some localities, Rangoon for instance; its rarity in Calcutta is a strange circumstance.

7. **EUPLŒA (CRASTIA) CORE**, Cramer.

A very common species occurring at all seasons.

8. **EUPLŒA (PADEMMA) KOLLARI**, Felder.

By no means a rare species, and occurs in company with the preceding. Both species have a very strong but not actually disagreeable odour, which neither my friends nor I are able to compare with any named scent. The males of both species may often be observed patrolling a small aërial space with the end of the abdomen curled under the body towards the thorax, and with the two beautiful yellow anal tufts of long hair distended to their fullest extent at right angles to the body. It seems very probable that these tufts or brushes of hair are used like holy-water sprinklers (aspergilli) for disseminating the scent with which their bodies are charged as an attraction for the females or to warn off their enemies; but it should be observed that the females are similarly odoriferous, though they are unfurnished with the male disseminating organs.

Mr. Moore in one of his tables* of "Mimetic species of *Euplœinæ* [= *Danainæ*] (Group B)" gives these two species, with another that does not occur in the Calcutta district, as mimics. As far as these two species go at any rate, I do not think he is justified in surmising that one mimics the other. In the first place, as both are strong-scented, and, as far as my olfactory nerves show, have the same scent, it seems impossible to say which is the model and which the mimic, though *E. core* is the commoner species of the two. Again, for the same reason both would be equally distasteful to their enemies. On the wing I can generally distinguish the males of *E. kollari* from *E. core*; it is impossible, however, to distinguish between the opposite sexes of either of the two species when flying.

Subfamily SATYRINÆ.

9. **MYCALESIS (ORSOTRIÆNA) MEDUS**, Fabricius.

Occurs somewhat sparsely during the rains, not met with in the winter or hot weather.

10. **MYCALESIS (ORSOTRIÆNA) RUNEKA**, Moore.

As above, but met with only in the cold and dry weather. I think it will hereafter be proved by breeding that these two supposed species are but seasonal forms of one species. For some reason at present unknown, the rainy season seems to give birth to ocellated forms amongst the *Satyrinæ.*

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* Proc. Zool. Soc. Lond. 1883, p. 209.

11. MYCALESIS (CALYSISME) BLASIUS, Fabricius.

Not uncommon during the rains. The glandular patch of scales which is placed on the underside of the forewing on the submedian nervure in the middle of a nacreous patch in the male is *black* and small. Mr. Rothney's list gives an additional species (*M. samba*).

12. MYCALESIS (CALYSISME) PERSEUS, Fabricius.

Very common during the cold and hot weather. The glandular patch is *black* and small.

13. MYCALESIS (CALYSISME) MINEUS, Linnæus.

Not uncommon during the rains. The glandular patch in this species is *ochreous* and large.

14. MYCALESIS (CALYSISME) INDISTANS, Moore.

Common during the cold and hot weather. The glandular patch is *ochreous* and large.

Summary of the four preceding species. Breeding will almost undoubtedly prove that *M. perseus* is the dry season and *M. blasius* the wet season generation of one species, and that similarly *M. indistans* is the dry season and *M. mineus* the wet season generation of a second species, thus reducing the species of the subgenus *Calysisme* occurring in Calcutta to two species, an ocellated form of both with an inner white fascia (*M. blasius* and *M. mineus*) occurring during the rains, and a non-ocellated form with the white fascia obsolescent (*M. perseus* and *M. indistans*) occurring during the dry season.

15. LETHE EUROPA, Fabricius.

In the cold weather this species affects dry ditches. It occurs also during the rains.

16. YPTHIMA PHILOMELA, Johanssen.

Common amongst grass throughout the rains.

17. YPTHIMA MARSHALLII, Butler.

Common everywhere during the cold and hot weather. This and the preceding species are probably seasonal forms of one and the same species.

18. YPTHIMA HUEBNERI, Kirby.

Common everywhere during the rains.

19. YPTHIMA HOWRA, Moore.

Common everywhere during the cold and hot seasons. Similarly this species and *Y. huebneri* are probably but two generations of one and the same species, the strongly ocellated form in both cases occurring during the wet season.

20. MELANITIS LEDA, Linnæus.

Very rare in Calcutta in the early winter, common during the rains.

21. MELANITIS ISMENE, Cramer.

Common in the cold and dry seasons. Keeps in shade under trees and bushes and amongst dead leaves during the day, but flies about rapidly in the evening. I have but little doubt that this and the preceding species are but seasonal forms of a single species.

Subfamily ELYMNIINÆ.

22. ELYMNIAS UNDULARIS, Drury.

A common species. Feeds on *Palmaceæ*.

Subfamily MORPHINÆ.

23. DISCOPHORA TULLIA, Cramer.

I have taken this species in dry ditches during the cold weather only.

*24. DISCOPHORA ZAL, Westwood.

I have not met with this species. My Calcutta females of *D. tullia* do not at all agree with Westwood's figure of *D. zal*. Mr. Moore informs me *(in epis.)* that "*D. tullia* and *D. zal* are undoubtedly distinct species" and that he has "one male of *D. zal*, and it agrees well with its female, of which I have specimens, in having three rows of well-defined spots on both fore and hindwings."

Mr. Moore has of late placed some of the genera usually included under the subfamily *Morphinæ* under the subfamily *Nymphalinæ*. Had he ever had an opportunity of seeing these species alive, I am sure he would certainly never have done so; all of them affecting shade, flying but little unless disturbed, and resting near the ground with closed wings usually amongst dead leaves. In these habits they agree with the *Satyrinæ*, in which subfamily they might perhaps be placed, though in my opinion they are better left under a subfamily of their own; the bold flight and sunshine-loving habits of the *Nymphalinæ* (most of which, moreover, rest with wide-open wings) seeming entirely to forbid their being associated with that family.

Subfamily ACRÆINÆ.

25. TELCHINIA VIOLÆ, Fabricius.

Common throughout the year.

Subfamily NYMPHALINÆ.

26. CETHOSIA CYANE, Drury.

A single worn female taken in the cold weather in a garden at Alipur.

*27. CIRRHOCHROA ANJIRA, Moore.

Mr. Rothney captured a single female specimen at Barrackpore. I have never met with it in Calcutta, but have received a single female from Bholahát in the Malda District.

28. ATELLA PHALANTA, Drury.

A very common insect at all seasons.

29. PYRAMEIS CARDUI, Linnæus.

A single female in the Botanical Gardens in November, one male at Ballygunj in March taken by Mr. T. G. H. Moncreiffe.

30. JUNONIA LEMONIAS, Linnæus.

31. JUNONIA ATLITES, Linnæus.

Placed under *Precis laomedia* in the Barrackpore list.

32. JUNONIA ŒNONE, Linnæus.

Common in the Botanical Gardens.

33. JUNONIA ORITHYA, Linnæus.

Somewhat rare in Calcutta.

34. JUNONIA ASTERIE, Linnæus.

35. JUNONIA ALMANA, Linnæus.

J. almana is almost undoubtedly the dry season and *J. asterie* the wet season form of one and the same species.

36. PRECIS IPHITA, Cramer.

A single male taken in March in a garden at Ballygunj.

37. ERGOLIS INDICA, Moore.

Common. Larvæ feed on *Tagia involucrata*, a twining plant with hairy stinging leaves.

Mr. Moore has lately separated this species from the Javan *E. ariadne;* under which name it appeared in the Barrackpore list.

38. ERGOLIS MERIONE, Cramer.

Common. Larva feeds on the castor-oil plant, *Ricinus communis.*

39. HYPOLIMNAS BOLINA, Linnæus.

Common except in the cold weather. Mr. Moore also gives *H. jacintha*, Drury, as a separate species. I believe it, however, to be one of the numerous varieties or seasonal forms of *H. bolina.*

40. HYPOLIMNAS MISIPPUS, Linnæus.

Much rarer than *H. bolina.* Both forms of the female occur here. The larva feeds on *Portulaca meridiana* in Calcutta.

41. LIMENITIS PROCRIS, Cramer.

Common, fond of settling high up in the trees with wings widely spread open. Larva feeds on *Anthocephalus cadamba.*

42. NEPTIS NANDINA, Moore.

I have taken this insect in the cold weather only; it is rare.

43. NEPTIS OPHIANA, Moore.

I have taken a single female specimen only in February.

44. NEPTIS JUMBAH, Moore.

Common. It has a much bolder and stronger flight than the other species of *Neptis* occurring in Calcutta, and differs from every species of the genus known to me in having a small round brown spot near the base of the hindwing on the underside.

45. NEPTIS KAMARUPA, Moore.

The commonest *Neptis* occurring in Calcutta, and on the wing throughout the year.

46. NEPTIS VARMONA, Moore.

There are three specimens of this species in the Indian Museum, Calcutta, but I have never taken it here. It is recorded from Barrackpore.

47. NEPTIS (RAHINDA) PLAGIOSA, Moore.

Somewhat rare, taken in the cold weather only.

48. ATHYMA PERIUS, Linnæus.

Two specimens only taken in the cold weather.

49. EUTHALIA GARUDA, Moore.

Very common. Larva feeds on mangoe.

50. EUTHALIA LUBENTINA, Cramer.

Rare. I have taken females only.

51. SYMPHÆDRA NAIS, Forster.

A single specimen taken by Mr. R. E. S. Thomas in Calcutta, which is probably its extreme eastward range. Common in the Rajmahal Hills.

52. CHARAXES FABIUS, Fabricius.

Somewhat rare. I have taken nearly all my specimens in the cold weather, sucking up the juice from the date-palms when cut for toddy. It occurs also in the rains.

53. CHARAXES *prox.* HINDIA, Butler.

I took a single female specimen in a garden at Alipur in the cold weather which agrees fairly with *C. hindia.* It has a narrow rufous outer margin to the upperside of the forewing, and the outer black macular fascia on the hindwing less conspicuous than in that species.

Family LEMONIIDÆ.

Subfamily NEMEOBIINÆ.

54. ABISARA SUFFUSA, Moore.

Common at all times except in the three coldest months. Has a very quick flight, but settles often on the upperside of a leaf in the shade with half-expanded wings.

Family LYCÆNIDÆ.

55. SPALGIS EPIUS, Westwood.

Taken on two occasions only in August in the Botanical Gardens flying about a pomegranate bush.

56. MEGISBA THWAITESI, Moore.

A single specimen taken in February. It probably is often overlooked owing to its close general resemblance to the species of the genus *Neopithecops*, which often actually swarm amongst bushes in shade.

57. NEOPITHECOPS GAURA, Moore.

58. NEOPITHECOPS ZALMORA, Butler.

This species has never been properly characterized, and I am unable to say in what particulars it is supposed to differ from *N. gaura*. At any rate the species of *Neopithecops* occurring in Calcutta are exceedingly variable, some specimens are entirely black on the upperside, others have the costal and outer margins of the fore and hindwings black, all the rest of the surface white, and there is every gradation between these extremes.

Mr. Moore writes to me—" *N. gaura* can be distinguished by its broad white discal area in both wings of both sexes. *N. zalmora* has a small discal white patch in the forewing only. I have both from the Calcutta district."

59. CURETIS THETYS, Drury.

Not uncommon amongst trees and high bushes, it generally settles with closed wings on the underside of a leaf out of reach. The female is dimorphic, one form having the discs of the wings above white, the other having them ochreous.

60. CHILADES VARUNANA, Moore.

Not common.

61. CHILADES LAIUS, Cramer.

Not common. It is synonymous with the *C. kandura* of Moore.

62. ZIZERA KARSANDRA, Moore.

Not common.

63. ZIZERA DILUTA, Felder.

Common everywhere amongst grass.

64. ZIZERA SANGRA, Moore.

Swarms amongst the grass at certain seasons.

65. ZIZERA PYGMÆA, Snellen.

Somewhat rare.

66. TARUCUS THEOPHRASTUS, Fabricius.

Rare.

67. TARUCUS PLINIUS, Fabricius.

Somewhat common. Very pugnacious.

68. CASTALIUS ROSIMON, Fabricius.

Fairly common amongst grass.

69. JAMIDES BOCHUS, Cramer.

Common amongst trees.

70. Lycænesthes bengalensis, Moore.

Rare, occurs throughout the year.

71. Nacaduba ardates, Moore.

Rare. Occurs amongst bushes.

72. Catochrysops strabo, Fabricius.

Common.

73. Catochrysops cnejus, Fabricius.

Common.

74. Catochrysops pandava, Horsfield.

Common. In April and May I have found the larvæ swarming on the hardly-open shoots of *Cycas revoluta*, thereby utterly destroying the appearance of the plant for the year. There is also a brood out in the rains.

75. Catochrysops bengalia, n. sp.

Male. Upperside violet-blue; the *cilia* dusky. *Forewing* with the outer margin narrowly black. *Hindwing* with a marginal series of dusky oval spots, the third from the anal angle larger, black and round; an anteciliary black line; tail dusky with a white tip. Underside gray; the *cilia* gray spotted with dusky. *Forewing* with a white-bordered brownish spot closing the cell, a curved discal series of joined similar spots, two series of marginal lunules; a black anteciliary line. *Hindwing* with four subbasal dusky spots surrounded with white. A much curved discal series, the upper spot on the costa usually the most prominent, and a spot closing the cell; marginal lunules much as in the forewing, but more prominent; a small black spot faintly crowned with orange in the first median interspace and three very minute anal ones beyond it, all four sometimes absent. In some specimens the discal series of spots on the forewing are much elongated towards the middle of the wing, and in all the specimens I have seen, except two from Sikkim, the spots on the disc and the one closing the cell of the hindwing have coalesced, forming an irregular brown patch in the middle of the wing, which patch sometimes reaches and includes the subbasal spots.

Female. Upperside shining iridescent violet-blue. *Forewing* with the apex widely and the outer margin decreasingly black. *Hindwing* with the costal margin dusky. Otherwise as in the male.

Expanse: ♂ ♀, 1·2 inches.

Near to *C. pandava*, Horsfield. Male smaller than that species, of a paler shade of blue; differing on the underside, in the coalescing of the discal spots, and the anal spots of the hindwing being much smaller or absent altogether. The female on the upperside is of quite a different shade of blue, which colour reaches to the costa and much nearer to the margin in the forewing, and covers all the hindwing except the costal

margin. The marginal series of black spots are smaller, more regular in size, and the third from the anal angle not conspicuously crowned with orange as in *C. pandava.*

I have taken numerous specimens of both sexes in the cold weather in Calcutta, and Mr. Nevill took it at Moisraka. It occurs also in Sikkim.

76. POLYOMMATUS BÆTICUS, Linnæus.

Common.

77. LAMPIDES ÆLIANUS, Fabricius.

Common.

78. LAMPIDES ELPIS, Godart.

Rare.

79. IRAOTA MÆCENAS, Fabricius.

Rare. Occurs amongst trees, especially the banian-tree, on which the larva feeds.

80. DEUDORIX DIENECES, Hewitson.

Taken only in the winter on the flowers of *Poinsettia pulcherrima.*

81. BASPA MELAMPUS, Cramer.

I have taken a male and two females only.

82. RATHINDA AMOR, Fabricius.

Recorded from Calcutta by Mr. Moore in P. Z. S. 1865, p. 776, under the name of *Myrina triopas*, Cramer.

83. VIRACHOLA ISOCRATES, Fabricius.

Common in the winter on the *Poinsettia.* Larva bred in March from the fruit of the pomegranate.

84. RAPALA SCHISTACEA, Moore.

Very common throughout the year. I have bred the larva from a plant growing in the Botanical Gardens, Calcutta. The larva and pupa agree exactly with the figures of an undetermined species given in Horsfield and Moore's Cat. Lep. Ins. Mus. E. I. Co. pl. xii, figs. 4, 4*a*., and which is probably *Rapala varuna*, Horsfield, a Javan species.

85. RAPALA ORSEIS, Hewitson.

A single male specimen taken in April on the flowers of *Diospyros montana. R. lazulina* from Ceylon is very closely allied to this species, but unlike my specimen it is not glossed with purple on the underside, which Hewitson gives as a distinguishing character of his *R. orseis.*

86. SPINDASIS KHURDANA, Moore.

A single male has been so identified by Mr. Moore.

87. SPINDASIS TRIFURCATA, Moore.

There is a single male specimen in the collection of the Indian Museum, Calcutta.

88. Spindasis vulcanus, Fabricius.

This species appears in Mr. Rothney's list under its synonymic name *Aphnæus etolus*. It is the commonest species of the genus occurring in Calcutta.

89. Spindasis tigrina, Moore.

Mr. Moore has identified some Calcutta specimens of *Spindasis* as this species. He has also queried other specimens of this and the preceding species; which, taken with the fact that *S. vulcanus* is very variable and the differences given between it and *S. tigrina* are very slight, suggests the suspicion that the latter species is at best but a doubtfully good one.

90. Tajuria longinus, Fabricius.

I have taken it rather plentifully in the winter on the flowers of the *Poinsettia*. It occurs also at other seasons.

91. Pratapa cleobis, Godart.

Taken with the preceding.

92. Sithon indra, Moore.

Rare, but occurs at all seasons. I have taken males only.

93. Loxura atymnus, Cramer.

Common.

94. Mahathala ameria, Hewitson.

Rare, always found high up amongst trees.

95. Nilasera amantes, Hewitson.

I took a single male specimen in the Botanical Gardens in May.

96. Satadra atrax, Hewitson.

Recorded from Calcutta by Mr. Moore in P. Z. S. 1865, p. 774. Captain Sage has taken a single specimen in May.

97. Amblypodia naradoides, Moore.

I have seen a single female only of this species, which was taken in the compound of the Indian Museum, Calcutta.

Family PAPILIONIDÆ.

Subfamily Pierinæ.

98. Leptosia xiphia, Fabricius.

Met with commonly almost throughout the year.

99. Terias hecabe, Linnæus.

Common at all seasons. The males of this, as of all the species of the *T. hecabe* group, have the scales on both sides of a small portion of the median nervure of the forewing near the base on the underside of a pale violet colour, and the subjacent portion of the wing membrane slightly depressed. On holding a male insect up to the light this secondary sexual character can be at once detected.

100. TERIAS SIMULATA, Moore.

This species and the next have the male mark above referred to.

101. TERIAS PURREEA, Moore.

Taken in the cold weather, not common.

102. TERIAS LÆTA, Boisduval.

There is one specimen of this species in the Indian Museum, Calcutta. *T. laeta* and allied species have in the male an oval patch of ochreous scales on the underside of the forewing near the base below the median nervure.

103. TERIAS DRONA, Horsfield.

104. TERIAS RUBELLA, Wallace.

Taken in December.

105. CATOPSILIA CATILLA, Cramer.

106. CATOPSILIA CROCALE, Cramer.

Feeds on *Cassia fistula.*

107. CATOPSILIA GNOMA, Fabricius.

108. CATOPSILIA PYRANTHE, Linnæus.

Feeds on *Cassia fistula.*

*109. CATOPSILIA ILEA, Fabricius.

110. IXIAS GANDUCA, Moore.

Occurs in February, and again during the rains. *I. latifasciata*, Butler, is given in Mr. Rothney's list, but *I. ganduca* is probably meant.

111. IXIAS MARIANNE, Cramer.

Very rare.

112. HUPHINA PHRYNE, Fabricius.

Common, feeds on *Capparis horrida.* It appears in Mr. Rothney's list under its synonymic name *H. evagete*, Cramer (*teste* Moore, P. Z. S. 1882, p. 255.)

113. HUPHINA HIRA, Moore.

I think that this is only a seasonal (winter) form of the preceding species, which is a very variable one.

114. HUPHINA ZEUXIPPE, Cramer.

This also appears to me to be a seasonal or varietal form of *H. phryne.*

*115. CATOPHAGA PAULINA, Cramer.

116. CATOPHAGA DARADA, Felder.

I have taken a single male specimen only in August.

117. APPIAS ZELMIRA, Cramer.

I have seen a single male specimen taken in Calcutta.

118. APPIAS HIPPOIDES, Moore.

I took a single male in a garden at Sealdah in November.

119. HIPOSCRITIA IMBECILIS, Moore.

A single male taken in February. It differs from that species in having the markings of the underside more pronounced, and also in having a diffused black spot on the underside of the forewing between the upper median nervules. It is doubtfully distinct from *H. indra*, Moore.

120. BELENOIS MESENTINA, Cramer.

Common. Feeds on *Capparis horrida.*

121. NEPHERONIA GÆA, Felder.

Very common. The female is dimorphic; the form which has the base of the wings yellow is rare. Feeds on *Capparis horrida.*

*122. NEPHERONIA HIPPIA, Fabricius.

I have taken but one species of *Nepheronia* in Calcutta. *N. hippia* is unknown to me; unless it is synonymic with *N. gaea*, which is very probable. Mr. Wallace in his paper* on Eastern *Pieridæ* unites them as one species.

123. DELIAS EUCHARIS, Drury.

Swarms in the winter, specimens are to be met with throughout the year.

124. DELIAS HIERTE, var. INDICA, Wallace.

A single male taken in February.

Subfamily PAPILIONINÆ.

125. PAPILIO (PATHYSA) NOMIUS, Esper.

This species comes out in profusion in March, and is the only single-brooded species in Calcutta with which I am acquainted. Larva feeds on *Polyalthia longifolia.*

126. PAPILIO (ZETIDES) DOSON, Felder.

Appears about the same time as the preceding, and specimens may be met with throughout the summer, but the spring brood is the largest. Larva feeds on the young leaves only of *Polyalthia longifolia.*

127. PAPILIO (HARIMALA) CRINO, Fabricius.

First appears in March, individual specimens met with throughout the hot weather. Very difficult to capture, and the rarest *Papilio* in Calcutta.

128. PAPILIO (ORPHEIDES) ERITHONIUS, Cramer.

Very common. I have bred the larva from *Ægle marmelos.*

129. PAPILIO (ILIADES) POLYMNESTOR, Cramer.

First appears at the end of March, specimens occur throughout the hot weather. I have bred the larva on pomelo (*Citrus decumana).*

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* Trans. Ent. Soc. Lond. 3rd series, vol. iv, p. 388.

130. Papilio (Laertias) pammon, Linnæus.

The commonest *Papilio* in Calcutta. All three forms of the female occur, the third form which mimics *P. hector* being the rarest. Larva reared on *Glycosmis pentaphylla*, *Ægle marmelos*, and the common lime.

131. Papilio (Menelaides) aristolochiæ, Fabricius.

Very common. Has a strong scent, and called the 'Rose Butterfly' in consequence by Calcutta schoolboys. Feeds on *Aristolochia*.

132. Papilio (Menelaides) hector, Linnæus.

Rare in Calcutta, taken in Chandernagore commonly in November. Also has a strong scent, and larva feeds on *Aristolochia*.

133. Papilio (Chilasa) dissimilis, Linnæus.

Not rare in the hot weather. On the wing it may often be mistaken for *Danais limniace*.

134. Papilio (Chilasa) casyapa, Moore.

Occurs in the hot weather. Mimics the Calcutta species of *Euplœa*. Both this species and the preceding feed on *Antiaris todicaria*. The larvæ and pupæ of the one are indistinguishable from those of the other, and both species, or species allied to both, occur always together in all parts of India; it therefore appears to me not improbable that they are one and the same species.*

Family HESPERIIDÆ.

135. Badamia exclamationis, Fabricius.

Occurs sparingly throughout the year except in the coldest months.

136. Parata chromus, Cramer.

I took a single male in the garden of the Seven Tanks in July.

137. Astictopterus olivascens, Moore.

Rare. Occurs amongst grass in shade.

138. Astictopterus salsala, Moore.

A very common species. Mr. Moore informs me that "the female of *A. salsala* has a curved discal row of seven white spots and two lower ochraceous discal spots, and is a larger species than *A. stellifer*, Butler," which latter has been described from Malacca and Ceylon, and appears to me to be identical with *A. salsala*.

139. Matapa aria, Moore.

Common throughout the year, actually swarms on sweet-scented flowers in the evenings during the rains.

140. Telegonus thrax, Fabricius.

Rare. Occurs in September.

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* Since writing the above, I accidently came across the following note in the P. Z. S. 1865, p. 756—"*P. dissimilis* and *P. panope* taken in *coitu*.—*A. E. Russell.*"

141. GANGARA THYRSIS, Fabricius.

Not uncommon, flies in the evening, rests during the day, usually on tree trunks, with closed wings. I have reared the larva on the date and other palms.

142. BAORIS OCEIA, Hewitson.

A single male taken in August of the normal eight-spotted form. Mr. Moore has lately (P. Z. S. 1883, pp. 532, 533) described two species of this genus from the Andamans and Darjiling respectively which I consider to be only varieties of *B. oceia*, that species in the number of its spots being the most variable hesperid I know, as previously pointed out by Mr. Wood-Mason and myself in a paper on the butterflies of the Andaman Isles (J. A. S. B. 1881, vol. l, pt. ii, p. 259).

143. PARNARA KUMARA, Moore.

A single male taken in February. Mr. Moore places this species in the genus *Baoris*, but, as it lacks the large tuft of hair in the middle of the hindwing on the upperside in the male which is the distinguishing feature of that genus, it appears to be better placed under *Parnara*.

144. PARNARA NAROOA, Moore.

A single male taken in the Botanical Gardens in August.

145. PARNARA FARRI, Moore.

One female only taken in February.

146. PARNARA BADA, Moore.

Common.

147. PARNARA BEVANI, Moore.

There is a single pair of this species in the Indian Museum, Calcutta, taken by Mr. Nevill in February, 1871.

148. SUASTUS GREMIUS, Fabricius.

Common. Larva reared on the date-palm.

149. CHAPRA SUBOCHRACEA, Moore.

Rare. Taken in November.

150. CHAPRA AGNA, Moore.

A common species.

151. TELICOTA BAMBUSÆ, Moore.

Very common at all seasons.

152. TELICOTA AUGIAS, Linnæus.

Rare.

153. PADRAONA PALMARUM, Moore.

Common.

154. PADRAONA DARA, Kollar.

Rare, taken in August.

155. AMPITTIA MARO, Fabricius.

Taken on one occasion in the Botanical Gardens in August.

156. **Taractrocera sagara**, Moore.

Rare. Taken in May and August.

157. **Halpe beturia**, Hewitson.

Common. Generally keeps high up amongst trees.

158. **Hyarotis adrastus**, Cramer.

Rather common.

159. **Tagiades ravi**, Moore.

Rare, rests with out-spread wings, often on the underside of a leaf.

160. **Tagiades khasiana**, Moore.

As above; somewhat plentiful in the rains.

161. **Udaspes folus**, Cramer.

Rather common.

162. **Coladenia tissa**, Moore.

I have taken a single male specimen in February in a garden at Alipur. In the rains another brood appears, which differs from the cold weather generation in having the ground-colour of both wings umber-brown, instead of ochreous, and all the black spots and markings more prominent.

163. **Hesperia galba**, Fabricius.

Decidedly rare in Calcutta, but occurs throughout the year.

V.—*Natural History Notes from H. M.'s Indian Marine Survey Steamer 'Investigator,' Commander* Alfred Carpenter, R. N. *Commanding. No. 1. On the Structure and Habits of* Cyrtophium calamicola, *a new Tubicolous Amphipod from the Bay of Bengal.—By* G. M. Giles, M. B., F. R. C. S., *Surgeon-Naturalist to the Marine Survey.*

(With Plate I.)

[Received 6th March;—Read 1st April, 1885.]

The little organism I am about to describe is one of the numerous objects that are found in the surface-net about the Palmyras shoal and mouth of the Dhamra river on the Orissa Coast. To this, or, at any rate, to such situations, it appears to be confined, for it was not met with either in the deep water of the Bay of Bengal, or in the clear blue shallow water about the Cheduba archipelago.

Shortly after commencing surface-net work in the above locality, I noticed amongst the hauls a body moving with tolerable activity, in appearance much like a morsel of drift wood. It swam about the tube in which it had been placed for observation in a nearly upright posture, sometimes upwards, sometimes obliquely across it, at others allowing itself to sink to the bottom. On closer examination, the four antennæ of a minute crustacean were seen protruding from one end;

and it was by the vigorous strokes of these appendages that the little creature was enabled to propel itself with its dwelling through the water. On placing it under a moderate power it was seen to be an Amphipodous crustacean; and it was very curious to observe the cautious way in which first the tips of the antennæ, then the head, and finally the body as far back as the 2nd thoracic somite would be protracted from the stick-like tube, the animal drawing itself back again on the least alarm; further out than this, it appeared disinclined to venture. In order to quiet its movements somewhat, a minute drop of alcohol was added to the water in the cell—a very useful device when it is wished to quiet, without killing, an organism, for after a few vigorous kicks the animal becomes quiet and sluggish, and remains so for some time, until the effects of the dose have worn off;—the moment it felt the touch of the spirit, the little crustacean rushed completely out of its tube, but as quickly dived in again head first. It was noticeable also that, when alive and at ease, it would frequently turn itself inside its tube, and protrude its head from the opposite extremity.

The tubes vary in size from 5—10 mm. long. by 0·5—1 mm. wide, and are nearly cylindrical.

Further examination shewed the Amphipod to belong to the Subdivision Domicola—Family Corophiidæ—Genus *Cyrtophium.*

To the generic characteristics—as adopted by Haswell from Spence Bate in his Catalogue of Australian *Malacostraca,* the only book available to me on board,—our species corresponds very well, but it differs in the antennæ being slightly longer than the antennules and, as well as the posterior abdominal appendages, unprovided with any distinctly curved spines; the latter, however, are furnished with straight spines, which in the natural flexed position of the abdomen are directed forwards, and thus serve equally well for fixation; the spines, moreover, figured for certain species are but very slightly curved. Neither does the relative length of antennæ and antennules afford very trustworthy generic characters: in some of my largest individuals, the antennæ were slightly the shorter, and the number of joints in the flagella of both pairs of appendages presented all variations from three to six. Our species does not, however, appear to be specifically identical with either of the four described by Haswell as known in Australia, or with any in Spence Bate's 'Catalogue of Amphipoda in the British Museum,' which I have since consulted.

From its habit, to be described further on, of making use of a piece of grass or reed as the basis for the construction of its tube, the species may be provisionally named :—

CYRTOPHIUM CALAMICOLA, n. sp.

Length 3—5 mm.

Colour a golden brown plentifully mottled with deep chocolate coloured blotches.

Head subquadrate with a slight beak-like prominence in the middle line. Antennules hairy, as long as the head and the first five segments of the thorax together; their peduncles subequally three-jointed, flagellum (in largest specimens) consisting of six joints, the last joint claw-shaped; length of flagellum to peduncle as 3 : 8. Antennæ hairy, generally equal to the antennules in length; the peduncle four-jointed, coxocerite very short, fourth joint slightly longer than the third; number of flagellar joints equal to that of the superior antennæ; length of flagellum to peduncle as 5 : 12. The number of joints in flagella of both superior and inferior antennæ varies considerably: I have met with instances of 3, 4, 5, 6; the joints appear to be always equal.

Thorax. 4th, 5th, and 6th somites of nearly equal length and longer than those before and behind them; 1st the shortest of all. Coxal plates increase in size from before backwards; those of the gnathopoda very small, and, with those of the two following appendages, not long enough to overlap; the posterior three considerably larger, imbricate. 2nd pair of appendages, or anterior gnathopoda, considerably less robust than the posterior; propodite long, ovate; dactylopodite as long as the propodite, its concave border very finely serrate; carpopodite triangular, its articulation with the meropodite so oblique as to coincide nearly with the long axis of the appendage. 3rd pair of appendages, or posterior gnathopoda, very large; dactylopodite as long as the propodite, provided with a peculiar serrature of square, chisel-edged teeth; propodite long, ovate; carpopodite triangular, its postero-inferior angle produced into a strong tooth with a smaller, less acute tooth close to the posterior border of its articulation with the propodite; articulation of carpopodite with meropodite as in the 1st gnathopod. 4th and 5th pairs of appendages alike in form, with claw-shaped dactylopodite; the latter is, however, much the more robust. 6th pair of appendages differing a good deal from the others; the posterior border of their dactylopodite provided with two curious short finger-like processes. 7th and 8th pairs of appendages alike in general form, the 7th slightly smaller than the 8th, their basipodites having the posterior border strengthened by a lamellar buttress-like expansion; dactylopodite rounded and provided with a large tuft of hairs; both these appendages are habitually kept extended backwards in the long axis of the body.

Abdomen. Anterior three appendages of the usual swimmeret type;

anterior, the largest, the 3rd the smallest; 4th with the rami unequal, the internal ramus two-jointed, projecting backwards and inwards behind the telson like a pair of horns; 5th smaller than the fourth, with internal ramus rudimentary; 6th rudimentary, bud-shaped, with a few very short, straight, backwardly directed, appressed spines. Telson short, blunt, conical, and armed, at the extremity of the dorsal surface, with spines similar to those on the last abdominal appendages.

The *tube* inhabited by this little creature is a very curious structure. It is, as a rule, considerably longer than the body of the animal it shelters, being more than capable of completely protecting it, when the antennæ, extended in front of the body, are drawn within. It is of a deep golden brown colour, and, on closer examination, is seen to be closely, but irregularly, banded with zones of darker and lighter tint, varying from a fine golden yellow, through a warm brown, to black. When some of this material is teazed out, it is seen to consist of coarse, nearly opaque, fibres uniformly stained throughout, and showing no structure, consisting, indeed, to all appearance, of a hardened secretion. For some time I was in considerable doubt as to the method of its manufacture. At first I had jumped to the conclusion that it was a worm tube that had been appropriated by the *Cyrtophium*, much in the same way that a hermit-crab fits itself with the shell of a dead mollusc. One day, however, I surprised one of the amphipods, in my live trough, evidently in the act of repairing its premises. The animal had completely withdrawn himself into the tube and was keeping it slowly but continuously revolving round him. The specimen was luckily a small one and hence the tube was transparent enough for me to see that the crustacean kept stationary, while the tube revolved. The transparency, however, was not sufficient to enable the exact method of deposition of the fibre to be made out. Shortly after this, a specimen was met with in which about half the tube only was covered with the opaque fibrous material and the other half transparent. On placing this beneath the microscope, I was surprised to find that the transparent portion was a very complex structure consisting of a layer of hexagonal thick-walled cells with an outer layer of long quadrilateral cells; the whole presenting an appearance which left one in no doubt as to its vegetable nature. Moreover, the structure was not that of an alga, and appeared most probably referable to that of some grass or reed. The greater part of this vegetable membrane was coated on both sides with the peculiar opaque fibrous material above described. Pieces of grass such as would serve for this purpose are taken commonly enough in the surface-net in the turbid waters at a river's mouth and are, no doubt, common at the bottom for some considerable distance beyond; indeed, I have dredged a specimen of a grass in excellent preservation many miles from land in nearly 200 fathoms. It is evident therefore that our *Cyrtophium* would experience no want of building materials in the moderate depths which he inhabits. Subsequent examinations, both by teazing and section, have shewn that this structure is the rule, *viz.*, a vegetable tube covered inside and out with hardened secretion. In some few of the tubes, however, no trace of vegetable structure could be detected; and it is probable that the animal is quite capable of constructing a protection for itself without the aid of such a basis. Haswell, indeed, following Spence Bate (*op. cit.*), appears to take this power as an accepted fact, for he includes the genus *Cyrtophium* in a section named '*Nidifica*' defined as "Having the power of secreting a substance, that, like a web, binds together the material of which the nest is composed, or one of a more membranous character." It appears to me, too, that the intricate peculiarities of the form of the limbs tends to corroborate this view. The peculiar teeth of the dactylopodite of the second gnathopod are clearly suited only for cutting, and the organ would be admirably adapted for trimming a piece of grass to suit its purpose, or for severing the thread of secretion; it is to be noticed that they are quite different from those of the anterior gnathopod, the serratures of which are simple like those of a saw. Again, the distal joint of the 6th thoracic appendages is admirably adapted for guiding a thread, but is so shaped as to be nearly useless either for ordinary progression or for manipulating the food. I have not been able to satisfy myself as to the position of the gland which would be necessary for the production of such a secretion. Cement-glands have been described in the gnathopodal propodites, and glands of a probably different nature also in more or fewer of the bases of the thoracic limbs. Glands are observable in both these situations in this species. The posterior part of the huge propodal joint of the 2nd gnathopod is filled with a collection of rounded nucleate cells which, so far as can be seen through the chitinous cuticle, appears essentially of a glandular character, and from its volume I am strongly inclined to believe is the organ concerned in the production of the membrane-forming secretion.

All attempts at keeping the animal in captivity failed. Even when kept in a large bulk of water aerated by means of a pressure-apparatus, specimens soon died, whether they were turned out of their tubes or allowed to retain them. This could hardly have been for want of oxygen, for a fish, exceeding the *Cyrtophium* many hundred times in bulk, was kept alive in the same apparatus for over five days under precisely the same circumstances. It is probable that the clearness of the water indispensable for observation had something to do with this.

Explanation of Plate I.

Fig. 1. *Cyrtophium calamicola*, n. sp., drawn to scale, × 44.
2. The same in its tube, in the act of swimming, × 18.
3. Portion of an unfinished tube showing a vegetable membrane lined at one end with opaque silk-like fibres, × 200 (about).
4. Small portion of a transverse section of a tube, × 200 (about).
5. A mandible, × 340.
6. 1st and 2nd maxillæ, × 170.
7. Maxillipedes, × 170.
8. Subchela of third thoracic appendages, showing the peculiar teeth of the dactylopodite and the glandular body in the propodite, × 300 (about).
9. One of the anterior abdominal appendages, × 44.
10. The three terminal abdominal appendages, with telson, from above, × 142.

* * *

VI.—*Notes on Japanese Land and Freshwater Molluscs.*—*By* O. F. von Möllendorff, Ph. D. *Communicated by the* Natural History Secretary.

[Received April 3rd;—Read May 6th, 1885.]

The following notes are based chiefly on a collection made by Dr. John Anderson during the year 1884 and sent by him to Deputy Surgeon General Hungerford and myself for classification. I take this opportunity to publish some new species formerly discovered by Messrs. Hungerford and Eastlake, and to give some corrections to my former paper on Japanese *Clausilia* published in this Journal (Vol. LI, Pt. II, 1882).

1. Nanina japonica, n. sp.

Testa depresso-globosa, semiobtecte perforata, acute carinata, superne striis curvatis transversis costuliformibus distantibus sculpta, subtus laevigata, nitida, tenuis, subpellucida, flavescens; anfr. 6 *fere plani, ultimus non descendens, basi inflatus, apertura obliqua, lunaris, peristoma rectum, acutum, margine columellari ad perforationem reflexo.*

Diam. 11½, *alt.* 6½ *mill.*

Hab. Specimen unicum ad Sengoku legit cl. Dr. Anderson.

The first *Nanina* known from Japan; I am not sure about its subgenus, which can hardly be ascertained without examining the animal. The nearest relation is apparently my *N. eastlakeana* from Fuchow in China (Jahrb. d. Mal. Ges. 1882, 371), which is somewhat larger and flatter. I think both species should be classed with *N. indica*, Pfr., which G. Nevill (Handl. Moll. Ind. Mus, 1878, 27) has under "subgenus doubtful," whilst Pfeiffer considers it to be a carinate *Macrochlamys.*

Another *Nanina* (*Macrochlamys?, Hemiplecta?*) at least 24 mill.

in diameter, I received from Mr. F. W. Eastlake, who obtained it in Nippon; it is, however, in too bad condition to be described.

2. HYALINIA (CONULUS) TENERA, A. Adams. One specimen from Chitose, Yeso.

3. HYALINIA (EUHYALINA) YESSOENSIS, Reinh., Sitz. Ber. Ges. Nat. Fr. Berlin, 17th April 1877, p. 91. Jahrb. d. Mal. Ges. IV, 1877, p. 314, t. IX, f. 6.—Kobelt, Faun. Jap. p. 8, t. I. f. 2.

Hakodadi (*A. Adams, Hilgendorf*). Onuma, Poronai, Chitose, Eastern Yeso (*Anderson*).

4. PATULA PAUPER, Gould. From various localities in Yeso, where it had already been collected. Known besides from Kamchatka, the Amoor, and North China.

5. HELIX SIMILARIS, Fér. Specimens from Yeso (Poronai) quite agree with the Chinese forms of this cosmopolitan snail. This is, so far as I know, the most northerly habitat of the species.

6. HELIX PECULIARIS, A. Adams. Hills of Hakoni, where Mr. Eastlake likewise collected this rare species.

7. HELIX JAPONICA, Pfr. Yeso.

8. HELIX BLAKEI, Neroc, Proc. Acad. Calif. III, 1861, p. 160, *fide* E. von Martens, Sitz. Ber. Nat. Fr. Berlin, 17th April 1877, p. 105. Kobelt, Faun. Jap. p. 23, t. VII, f. 10, 11.

A snail which Dr. Anderson obtained at Chitose, Yeso, agrees perfectly with Kobelt's description and figure of *Helix blakei*, Neroc, the original description of which I am unable to compare. Dr. Hilgendorf collected the same species near Hakodadi. I do not think the shell can be classed in the subgenus *Ægista*, as Kobelt has it, but would place it in *Camena*.

9. HELIX PELIOMPHALA, Pfr. Typical forms from Kamahura, Ishiyama in Central Japan; a small rather high variety from several places in Yeso.

10. HELIX AMALIÆ, Kobelt. Quite corresponding to the author's figure, from Kiga.

11. HELIX LUHUANA, Sow. Kiga.

12. HELIX QUÆSITA, Fér. A curious small form, light brown without a band, but otherwise typical, from Ogenohama, Yeso.

13. HELIX LÆTA, Gould. Onuma, Chitose, Ogenohama (Yeso). Originally described from Hakodadi. The specimens for the greater part (like most of the snails collected) not full grown, are partly without bands.

14. BULIMINUS ANDERSONIANUS, n. sp.

Testa profunde rimita, turrito-conica, tenuis, striis transversalibus et lineis spiralibus rugulosis quasi granulata, corneofusca; anfr. 7½—8 *convexiusculi, sutura impressa discreti, ultimus magnus antice paullum ascendens. Apertura parum obliqua, truncato-elliptica, peristoma expansum, reflexiusculum, marginibus callo tenui junctis, externo arcuato, columella subplicata.*

Long. 21½, *lat.* 8, *apert. alt.* 7½, *lat.* 5½ *mill.*

HAB. Ad Onuma, Poronai insulæ Yeso leg. cl. Dr. Anderson.

This fine *Buliminus* differs from the only species known from Japan, *B. reinianus*, Kob., in its smaller size, much more conical spire, broader base, deeper umbilical slit, but principally by its very distinct sculpture consisting of transverse striation and rather irregular spiral lines which together produce a granulose aspect of the cuticle.

15. BULIMINUS JAPONICUS, n. sp.

Testa rimata, ovato-turrita, solidula, oblique striatula (albida?, cornea?); anfr. 7½ *vix convexi, sutura impressa discreti, ultimus basi rotundatus* ½ *totius altitudinis adaequans; apertura parum obliqua, truncato-elliptica, peristoma expansum, reflexiusculum, marginibus callo sat valido junctis, columella haud angulata nec plicata.*

Long. 28, *lat.* 11, *apert. long.* 11, *lat.* 8 *mill.*

HAB. Prope urbem Osaka, comm. cl. F. W. Eastlake.

The unique specimen of a *Buliminus* which Mr. F. W. Eastlake has sent me for description appears to differ specifically from *B. reinianus* in its much more ventricose almost ovate shape and its greater solidity, in having ½ a whorl less, the last whorl higher, the lip of the peristome broader, the parietal callus thicker, and the columella not plicate. The specimen being dead and faded, I cannot describe the colour, which is most likely brownish.

16. STENOGYRA (OPEAS) PYRGULA, A. Adams.

A single specimen from Onuma, Yeso. I have received the same species from the Nikko mountains, where it was collected by Mr. F. W. Eastlake.

Genus CLAUSILIA, Drap.

Group *Euphaedusa*, Böttg.

17. CLAUSILIA PROBA, A. Ad. The localities Utsonoma and Mamada (Nippon) given in my former paper (J. A. S. B. LI, Pt. II, 1882) were inserted by mistake, the species collected there being *Cl. tau*, Böttg. *Cl. proba* has only been found on the island of Kiushiu and in the Corean Archipelago.

Group *Stereophaedusa*, Böttg.

18. CLAUSILIA TETRAPTYX, v. Mölldff., l. c. p. 7, t. I, f. 7.

I find that this form does not belong to the group of *Cl. validiuscula*, v. Mart, as formerly stated, but to that of *Cl. brevior*, v. Mart. I could not break up a specimen at the time, and by looking into the shell I must have got an entirely erroneous view of the clausilium, which is essential for determining the subsection. Furthermore, I had only an imperfect knowledge of *Cl. brevior*, which is not very well represented by the figure in Kobelt's Fauna Japonica, but of which I have since received authentic specimens. *Cl. tetraptyx* is a little larger (but this does not matter much, as *Cl. brevior* is rather variable in size), the colour is brown with a reddish tint, whilst *Cl. brevior* is pale horn-coloured, the peristome is broader, slightly lipped and liver-coloured, its upper sinuation somewhat deeper. The palatal plaits are somewhat longer and farther up in the interior of the shell. Altogether I think *Cl. tetraptyx* is hardly more than a variety of *Cl. brevior.*

I subjoin the description of a new form of this interesting little group which Mr. F. W. Eastlake has discovered near Nikko.

19. CLAUSILIA NIKKOENSIS, n. sp.

Testa elongato-fusiformis, pallide cornea, subtiliter sed distincte striata; anfr. 10½—11 *convexiusculi; apertura ovalis, parum obliqua, peristoma continuum, superne solutum paullum sinuatum, expansiusculum. Lamella supera sat valida, marginalis, cum spirali continua, infera valida, valde torta, intus subfurcata, usque ad marginem producta, subcolumellaris emersa, plica principalis elongata, palatales* 5 *breves, superior et infima paullo longiores. Clausilium latum, subtus rotundatum.*

Long. 18, *diam.* 3½ *mill.*

This species is distinguished from *Cl. brevior* by the longer and much slenderer shell, the more elongate aperture with higher "sinulus", the lower parietal lamella reaching the margin of the peristome, the upper lamella being less high.

Group *Megalophaedusa*, Böttg.

20. CLAUSILIA MARTENSI, Herklots, MS.—E. v. Martens, Mal. Bl. VII, 1860, p. 40; Albers-Mart., Hel. 1860, p. 275; Ostas. Landschn. 1867, p. 32. Pfeiffer, Mon. Hel. VI, 1868, p. 494, VIII, 1877, p. 519. A. Adams, A. & M. N. H. 4th ser. I, p. 469. Kobelt, Faun. Jap. p. 79, t. VIII, f. 1—4. *Cl. reiniana*, Kobelt (olim) J. d. Mal. Ges. II, 1875, p. 330, t. XII, f. 7-9, ibid., III, 1876, p. 154, t. V, f. 8. Pfeiffer, Mon. Hel. VIII, 1877, p. 471. *Cl. yocohamensis*, Crosse, J. de Conch. XXI, 1873, p. 68, t. V, fig. 3, 3 *a*. Pfeiffer, Mon. Hel. VIII, p. 481. Böttger, Claus. Stud. 1876, p. 62. Kobelt, Faun. Japon. p. 81, t. VIII, f. 5—9 *Cl. yocahamensis*, var. *reiniana*, Böttger, Claus. Stud. 1876, p. 62. Pfeiffer-Clessin, Nomencl. Hel. p. 392.

From what I have seen of the big Japanese *Clausiliae* I do not believe that two species can be recognised. The characters by which they are to be distinguished vary a good deal even at the same locality, especially the more or less visible subcolumellar lamella. If Kobelt's identification of his *Cl. reiniana* with *Cl. martense*, Herklots, is correct, as I think it is, then *Cl. yocohamensis*, Crosse, will have to follow suit. Perhaps varieties may be distinguished, but for this purpose the habitats of the different forms will have to be more exactly recorded than they have hitherto been.

Dr. Anderson obtained one dead specimen of a *Megalophaedusa* at Mianoshda; if the two species are to be separated, this would be *Cl. yocohamensis*, Crosse.

21. CLAUSILIA DUCALIS, Kobelt. A single specimen from Hakoni, where Mr. R. Hungerford collected the same species before.

Group *Cylindrophaedusa*, Böttg.

My friend Dr. Böttger does not quite agree with me in classing *Cl. gracilispira*, mihi (l. c. p. 5, t. I, f. 5), with the Himalayan *Cl. cylindrica*, Gray, and would rather propose to insert it in the group of *Cl. validiuscula*, Mart. (*Hemiphaedusa* subgroup 1.). The species does not seem to agree perfectly with either of the two groups, but the shape of the shell and of the lower parietal lamella are certainly nearer those of *Cl. cylindrica*. Another question is, whether *Cylindrophaedusa* can be upheld as a separate subsection at all. The investigation of Western and Central China will probably enable us to decide these questions.

Clausilia micropeas, mihi, is certainly no *Cylindrophaedusa*, as I shall show further on.

Group *Hemiphaedusa*, Böttg.

(α) Subgroup of *Cl. validiuscula*, v. Mart.

As mentioned above *Cl. tetraptyx*, mihi, is to be removed from this subgroup.

(β) Subgroup of *Cl. sublunellata*, Mölldff.

The following species form a subgroup of their own within the section *Hemiphaedusa*, to which they undoubtedly belong on account of their very receding, almost straight, lower parietal lamella and their narrow clausilium. The first subgroup, that of *Cl. validiuscula*, shows, instead of a lunella, a number of lateral palatal plaits, whilst the following subgroups have a more or less straight lunella and no 'palatales' except the principal one.

The following species, however, have below the principal plait, first an upper palatal, after this a very short second one, and then a short straight lunella, which in some forms is somewhat obsolete, but always discernible. We have, therefore, in these forms, a remarkable transitional group between that of *Cl. validiuscula* and the other *Hemiphaedusae*.

22. CLAUSILIA SUBLUNELLATA, n. sp.

Testa ventricosofusiformis, tenuissime striatula, solidula, corneofusca, anfr. 11 *subplani, superiores quattuor spiram cylindricam obtusam efficientes, ceteri celeriter accrescentes, duo penultimi maximi, ultimus attenuatus basi rotundatus. Apertura elongata piriformis, sinulus rectus, peristoma fere solutum, valde incrassatum, reflexiusculum. Lamella supera valida, obliqua, marginalis, intus triangulariter elevata, cum spirali continua, infera recedens, stricta, intus valida, subcolumellaris immersa, oblique intuenti intus conspicua. Plica principalis modica (lineam lateralem superans), palatales duae, supera principali subparallela brevis, infera brevissima, lunella brevis, strictiuscula. Clausilium ?*

Long. 24, *diam.* 5, *apert. long* 6, *lat.* 4 *mill.*

HAB. In montibus Nikko leg. cl. F. W. Eastlake.

23. CLAUSILIA SERICINA, v. Mölldff. (l. c. p. 6, t. I, f. 4), which Mr. Hungerford collected in the same region, and which I cannot compare at present, will probably prove to be a near relation to *Cl. sublunellata*, and undoubtedly belongs to the same subgroup.

24. CLAUSILIA SUBULINA, v. Mölldff, l. c. p. 13.

One specimen collected by Mr. F. W. Eastlake in the Nikko mountains agrees perfectly with my diagnosis of the above species, of which Mr. Hungerford possesses the only example found. It has the peculiar arrangement of the palatal plaits in common with *Cl. sublunellata*, *viz.*, an upper palatal plait under the principalis, then a shorter one, and below this a short straight lunella, which is, however, not so distinct. *Cl. subulina* is the only species of the subgroup in which the subcolumellar lamella reaches the peristome.

25. CLAUSILIA MICROPEAS, v. Mölldff., l. c. p. 12.

The idea of classing this small form with *Cl. gracilispira*, mihi, in the sub-section *Cylindrophaedusa* has to be given up entirely ; the lower parietal lamella requiring its being placed in *Hemiphaedusa*. I find, further, that there is an indication of a lunella below the second (generally punctiform) palatal plait. The species therefore fits very well into our present subgroup.

Mr. F. W. Eastlake collected a single specimen on his tour to Nikko without noting a special locality. Lake Chusinji, where Mr. Hungerford obtained the species, is not far from Nikko.

26. CLAUSILIA OPEAS, n. sp.

Testa cylindraceofusiformis, subtiliter striatula, solidula, cornea, anfr. $10\frac{1}{2}$ *planulati, ultimus rugosostriatus, apertura elongato-rotundata, peristoma solutum, expansum, reflexiusculum, leviter incrassatum. Lamella supera marginalis, modica, infera remota vix conspicua, intus valida, subcolumellaris immersa oblique intuenti conspicua. Plica principalis* *lineam lateralem vix superans, palatalis supera brevis divergens, infera punctiformis, lunella brevis stricta. Clausilium ?*

Long. 17½, *diam.* 3½, *apert. long.* 3½, *lat.* 2½ *mill.*

HAB. In montibus Nikko leg. cl. F. W. Eastlake.

Another species of the same subgroup, at once distinguished by the cylindraceous slender shell.

(γ) Subgroup of *Cl. platydera*, v. Mart.

27. CLAUSILIA PLATYAUCHEN, v. Mart., Sitz. Ber. Ges. Naturf. Fr. Berlin, 17th April, 1877, p. 110. Böttger, Claus. Stud. p. 67. Kobelt, Faun. Jap. t. IX, f. 8. *Cl. fusangensis*, v. Mölldff, l. c. p. 8, t. I, f. 8.

My friend Dr. Böttger has pointed out to me that my species is the same as von Martens' previously published *Cl. platyauchen*, of which I had not seen a specimen, and which is not very accurately figured in Kobelt's Fauna of Japan. I have since convinced myself that Dr. Böttger is right.

Dr. Anderson collected a small variety of the same species at Chusinji which is only 23—25 mill. in length.

(δ) Subgroup of *Cl. strictaluna*, Böttg.

28. CLAUSILIA STRICTALUNA, Böttg., var. *nana*, n.

Differt a typo testâ multo minore, ventricosiore, aperturâ magis rotundatâ, lamellâ subcolumellari immersâ.

Long. 9—10, *lat.* 2¾ *mill.*

Nagasaki (*Hungerford*). This dwarf form, although closely related to *Cl. strictaluna*, may ultimately be considered to be a separate species, if a greater number of examples of both can be examined.

29. CLAUSILIA AURANTIACA, Böttg., var. ERBERI, Böttg.

My var. *minor* (l. c. p. 9) is the same as Böttger's var. *erberi*, as the author has himself confirmed.

30. CLAUSILIA PLICILABRIS, A. Adams, A. & M. N. H. 4th ser. X, 1868, p. 469. Pfeiffer, Mon. Hel. VIII, 1877, p. 476.

This rare species has been found by Mr. F. W. Eastlake on his tour to Nikko, and by Mr. B. Schmacker in the Hakoni mountains.

(ε) Subgroup of *Cl. caryostoma*, v. Mölldff.

31. CLAUSILIA CARYOSTOMA, v. Mölldff., l. c. p. 6, t. I, f. 5.

This interesting species is certainly a *Hemiphaedusa*. The "ventral" position of the palatal plaits bring it near to the subgroup of *Cl. strictaluna*, in which especially *Cl. aurantiaca* shows the same receding position of the closing apparatus. My former remark that a lunella is deficient has to be rectified, inasmuch as the punctiform plait between the two 'palatales' may very well be considered to be a short lunella.

(δ) Subgroup of *Cl. hyperolia*, v. Mart.

Of this subgroup, I described in my former paper two new species, *Cl. rectaluna* and *Cl. aptychia*, but having since received more material for study from Messrs. Eastlake, Schmacker, and Anderson I am now convinced that they have to be reduced to varieties, or, perhaps, even mere forms, of *Cl. hyperolia*. I was led into this error by the scanty supply of specimens; and this is a characteristic instance of the difficulty, if not impossibility, of getting a correct idea of a species of *Clausilia*, especially in the Asiatic groups, from single individuals. *Cl. hyperolia* seems to be very variable in size, shape, etc., but none of the distinguishing characters of the various local forms seems to be of specific value. I now propose to distinguish the following varieties.

32. Clausilia hyperolia, v. Mart., *type*, 17-20 mill. in length. Near Tokio (*Hilgendorf*, *Rein*, *Schmacker*), hills on the way to Nikko and Kavasaki (*Eastlake*).

Var. reetaluna, v. Mölldff., somewhat more slender, of pale horny colour, with a rudimentary principal plait; the other characters given (l. c. p. 9) are not constant, inasmuch as the spiral bands or lines are often deficient in the type itself, whilst the *lamella infera* often terminates in the same way as described in *Cl. rectaluna*.

Kamatokogiro (*Hungerford*).

Var. aptychia, v. Mölldff., larger, up to 25 mill. long, upper parietal lamella somewhat smaller, lower lamella a little more visible in the aperture, the lunella sometimes, but not always, evanescent.

Dr. Anderson collected this form in some numbers at Hakoni and Chusinji, the former place being the original habitat. It is very variable in size and somewhat also in shape, form of the aperture, and thickness of the peristome.

Var. planulata, v. Möll., *differt a typo testâ longiore, multo gracilliore, anfractibus planulatis, lamellâ superâ humili, inferâ magis recedente, antice inconspicuâ.*

Two specimens from Kobi (*Eastlake*). Of all the forms, this has perhaps the best claim to specific distinction, and, if the characters as given above prove constant in a greater number of examples, it had better be separated, especially as the locality is widely distant from those of the other varieties.

33. Succinea lauta, Gould. Hakodadi, Oginohama, Poronai, Chitose, all on the island of Yeso, where the species had been previously found.

34. Limnæus japonicus, Jay. Lake Chusinji, Yeso.

35. Limnæus pervius, v. Mart. Central Japan.

36. Alycæus nipponensis, Reinh. Yeddo (*Dönitz*, *Hilgendorf*); Nikko and Hakoni mountains (*Eastlake*), and Mianoshda (*Anderson*).

37. DIPLOMMATINA LABIOSA, v. Mart., Sitz. Ber. Ges. Nat. Fr. 17 April 1877, p. 98. Kobelt, Faun. Jap. p. 112, non *D. labiosa*, W. T. Blanford, J. A. S. B. XXXVII, Pt. 2, 1868.

This fine *Diplommatina*, which has, so far as I know, not yet been figured, requires renaming on account of *D. labiosa*, Blanf. As this has probably been already done, I mention the species under the old name in order to avoid a superfluous synonym.

It was discovered by Dr. Hilgendrof in the Hakoni mountains, where Messrs. Hungerford and Eastlake have since collected it. Hungerford also found it at Asinoin, and Anderson at Myiokishita.

38. DIPLOMMATINA NIPPONENSIS, n. sp.

Testa dextrorsa, rimata, elongate ovato-conica, subtiliter sed distincte et regulariter striatula, rufescenticornea, anfr. 7 convexi, superiores spiram conicam acutiusculam efficientes, duo ultimi paullum distorti, ultimus angustior, antice ascendens. Apertura fere verticalis, subcircularis, peristoma duplex, reflexiusculum, expansum, superne in anfractum penultimum productum. Lamella columellaris humilis spiraliter recedens, plica palatalis longiuscula, supra aperturam conspicua.

Long. 2½, *diam.* 1½ *mill.*

HAB. Ad Asinoin leg. cl. R. Hungerford, in montibus Hakoni leg. cl. F. W. Eastlake.

So far as I know, only two species of *Diplommatina* have been described from Japan, the preceding and *D. pusilla*, v. Mart. From both of these our new form is widely different. The nearest are *D. paxillus*, Gredl., of Central China and *D. hungerfordiana*, Nev., of Formosa; which are both a little larger, and much more regular and rounder in shape, while *D. nipponensis* is at once distinguished by the regular pointed cone of the upper whorls and the distorted suddenly enlarged lower ones. The sculpture of our species is much more regular, the columellar margin of the peristome is rounded, hardly angulate at all, whilst *D. hungerfordiana* is slightly subangulate, and *D. paxillus* distinctly angulate at the base.

39. JAPONIA BARBATA, Gould. I am indebted to Mr. F. W. Eastlake for some specimens of this rare shell which were collected by him in the Hakoni mountains. They have enabled me to settle the vexed question of what *Japonia*, Gould, really is. Gould says nothing about its affinities, E. von Martens (Ostas. Landschn. 1867, 12, 127) supposed it to be related to *Cyclotus*, and Pfeiffer placed it at first near *Hydrocena*, later on considering it to be a section of *Realia*. The descriptions of the genus and its three species given by Gould are, it is true, so incomplete and vague that very little can be concluded from them. The examples collected by Mr. Eastlake agree very well with the description of *T. barbata*, Gould;

at the same time they show close relationship to the small species of sculptured *Cyclophori* described from China, *viz.*, *C. trichophorus*, mihi, *sexfilaris*, Heude, etc. These do not, however, as I have lately found out and shall elsewhere prove, belong to *Cyclophorus*, but to *Lagochilus*; and, from the analogy of the shells, I do not doubt that the Japanese species will have to be placed in the same genus. In that case fanatic adherents of strict priority might contend that this genus should be named *Japonia* (published 1859) instead of *Lagochilus* (1864), but, as the few words by which *Japonia* was introduced cannot be called a scientific description, whereas *Lagochilus* was properly described and published by Blanford, I hope nobody will contest the validity of the latter name. Should it be found that the Chinese and Japanese species deserve to be separated from the Indian forms as a section of their own, *Japonia* should be retained as its name.

40. HELICINA JAPONICA, A. Adams. Sengoku (*Anderson*), Mianoshda Hills, Chusinji (*Hungerford*).

41. MELANIA LIBERTINA, Gould. In various forms from the Hakoni Lake, Kiga, Central Japan, and Yeso. I quite agree with E. von Martens and Kobelt, who combine *M. japonica*, Reeve, *M. tenuisulcata*, Dunker, *M. ambidextra*, v. Mart., and *M. reiniana*, Brot, all with *M. libertina*, Gould; as frequent transitions from one form to another are to be found.

42. MELANIA NIPPONICA, Edg. Smith. Lake Biwa.

43. MELANIA BIWÆ, Kobelt. Lake Biwa. Messrs. Hungerford, Schmacker, and Anderson have collected this fine species in some numbers, and I have seen no transitional forms which would necessitate its combination with the preceding species.

The *Paludinae* collected by Dr. Anderson are all young or imperfect specimens.

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Part II.—NATURAL SCIENCE.

No. II.—1885.

VII.—*Natural History Notes from H. M.'s Indian Marine Survey Steamer 'Investigator,' Commander* Alfred Carpenter, R. N., *Commanding. No. 2. Description of a new Species of the Amphipod Genus* Melita *from the Bay of Bengal.—By* G. M. Giles, M. B., F. R. C. S., *Surgeon-Naturalist, Indian Marine Survey.*

[Received April 21st;—Read May 6th, 1885.]

(With Plate III.)

The little animal described below was brought up by the hempen tangles from 12½ fathoms near the Mutla Light Ship. When placed in a glass jar, it shewed a tendency to hide itself away amongst the pieces of tangle which remained sticking to some specimens of *Murex spinosa* that had been placed in the jar along with it, and when disturbed escaped by rapid backward jerks.

Two specimens were taken, one slightly larger than the other. The larger was used for dissection and proved to be a female. The smaller was reserved for preservation. Fig. 1. was taken from it. The relative proportions of its parts appeared identical in all respects with those of the larger, with the exception of the propodite and dactylopodite of the second gnathopod, which in the larger specimen exceeded in size that of the smaller to an extent out of all proportion to the difference of their sizes, which were about 5 and 6 mm. respectively. Colour—ivory-white marked with patches of chocolate-coloured pigment.

MELITA MEGACHELES, n. sp.

Body generally depressed rather than compressed. Broadest at the middle of the thorax, thence tapering to head and abdomen.

Head subquadrate, longer than broad, its depth nearly equalling its length, irregularly mottled with chocolate-coloured spots. Eyes situated at the anterior angles of the carapace, compound, prominent, of a coppery violet colour. Antennules hairy, robust, as long as the head and the anterior six segments of the thorax; peduncle three-jointed, middle joint the longest; flagellum as long as the first two joints of the peduncle; a minute appendage, as long as the last joint of the peduncle, with a dilated antepenultimate joint, springs with the flagellum from the peduncle. Antennæ hairy, slightly shorter than the antennules, arising a little below and behind them; peduncle four-jointed, coxocerite short, its antero-inferior angle prolonged into a pointed prominence; third joint the longest, flagellum equals this in length. Mandibles triangular with a long pediform appendage.

Thorax depressed. The posterior three-fourths of each segment decorated with winged patches of madder-brown pigment, except the first and seventh, which are only faintly mottled. Coxal plates considerably less in depth than the segments, decreasing in size from before backwards; the anterior plate quadrangular with its anterior inferior angle prolonged into a beak-like process; the remaining plates foliiform, each with a central patch of pigment. Maxillipedes small, pediform. 2nd pair of appendages (1st gnathopod) very hairy, nearly the smallest of the ambulatory limbs; propodite with palm so vague as to be exunguiculate rather than subchelate. 3rd pair of appendages (2nd gnathopod) of relatively immense size; dactylopodite with its posterior margin entire except for two slight smooth prominences; propodite more than twice as wide as the depth of the thorax, quadrangular, with rounded corners, its inferior border furnished with four large roserrations with three isolated bundles of hairs in the intervals. 4th and 5th pairs of appendages subequal, hairy, exunguiculate, closely resembling each other in every detail, closely approaching in length to 2nd gnathopod. 6th pair of appendages the shortest of the ambulatory limbs; the basipodite having its posterior border strengthened by a lamellar, buttress-like expansion; the dactylopodite forming a strong claw. 7th and 8th pairs of appendages much resembling each other, but the 8th considerably the larger in all points; basipodites with buttresses like the 6th pair of appendages; the dactylopodites forming long strong claws; the eighth is the longest of all the thoracic limbs.

Abdomen somewhat compressed, especially the last four segments, the first two with large pigmented marks, the third faintly blotched, the last three earthy-brown marked with madder-brown blotches. **Anterior** three pairs of appendages subequal, of the usual amphipodal swimmeret type. 4th and 5th pairs of appendages robust, biramous, the rami subequal with short, stout, straight spines; the fourth much larger than the fifth. 6th pair of appendages short, stout, internal ramus almost rudimentary, armed, like those of the 4th and 5th, with short, stout, straight spines. Telson nodular with a few short spines.

EXPLANATION OF PLATE III.

Fig. 1. Side view of *Melita megacheles* in natural colours, × 25.

Fig. 2. Distal joints of 2nd gnathopod of the female specimen, × 20 about, *i. e.*, drawn as if belonging to a body on the same scale as fig. 1, to shew the comparative size of these appendages in the two specimens.

Fig. 3. Distal joints of antennular appendage, × 275. In the before-mentioned dilated joint are some highly refractile bodies probably of the nature of otoliths.

Fig. 4. Abdominal appendage of the 6th pair, × 60.

VIII.—*Natural History Notes from H. M.'s Indian Marine Survey Steamer 'Investigator,' Commander* ALFRED CARPENTER, R. N., *Commanding.*

No. 3. *On the* Prothallus *of* Padina pavonia.—*By* G. M. GILES, M. B., F. R. C. S., *Surgeon-Naturalist, Indian Marine Survey.*

[Received April 21st;—Read June 6th, 1885.]

(With Plates IV and V.)

The reproductive process of the genus *Padina* is a subject which has, I believe, been involved in some uncertainty.

The most recent work which I possess that deals at all minutely with the marine algæ is the last edition of the Micrographic Dictionary.

In this only one kind of "spore" is described alternating with tufts of jointed hairs (paranemata) "which Agardh appears to have mistaken for antheridia." This is, I believe, a correct surmise, more especially as I have recently had the good fortune to meet with a body which, there can be little doubt, is the prothalloid or sexual stage of the plant; the stage usually found being non-sexual, like that of fully formed ferns.

To the description of the adult plant, as given in the above-quoted work, there is little or nothing to add; but the spores dropped from its indusia give rise not to a similar form but to an alternate stage possessing both kinds of sexual organs.

Padina pavonia is a weed very common on the coast of British Burmah, growing on rocky spots, more especially in situations where there is a good deal of sand and mud in the interstices of the rocks.

Some days ago, while collecting marine algæ amongst the rocks of Kyouk Phyou harbour, a place was visited where this plant was exceptionally abundant. It was also as remarkable for its bareness of other algæ, the only others present being *Caulerpa sedoides* and a small rhodosperm not in fruit but probably belonging to the genus *Acanthophora*, and even these were very few and far between.

On the rocks on which the *Padina* were growing was noticed a number of small bodies about 5 mm. in diameter of a beautiful deep green colour, and generally of oval outline. Some of these were growing actually on the fronds of the *Padina*, while immense numbers were clustered on the rocks around.

On closer examination, with a pocket lens, it was seen that in many instances very young fronds of the *Padina* were sprouting from the circumference of the green bodies. On taking these up, it was observable that the little buttons of tissue were beginning to shrivel and decay, and that the young *Padina* fronds were firmly attached to their remains.

These circumstances appeared to point to some intimate connection between the two growths, and a number of the "prothalli" were accordingly collected and carried back to the ship for more minute examination.

On placing one of them beneath a Coddington lens, it was seen that the green substance was encased in a coating of white transparent tissue, much thicker and more opaque on its under than on its upper surface. The green substance itself was beautifully marbled with oval or circular markings of a deeper green than the rest.

These points having been noted and drawn, one of the specimens was placed in the microtome and a number of transverse sections taken. On placing these beneath the microscope, a structure of really wonderful complexity was displayed (Fig. 3.) Enveloping the mass is the white tissue, in which, so far as could be seen, there are no apertures. This tissue is composed of a network of stellate cells with anastomosing tails, exactly like the structure known in animal histology as adenoid connective tissue; in the meshes of this, on the under surface of the prothallus, are enclosed a number of opaque bodies to be more minutely described further on. Enclosed in this are a number of tubular bodies, containing the reproductive organs, supported by bands of tissue springing from the peripheral layer. The space between these is filled up by a mass of spherical nutritive cells containing abundant chlorophyll.

To return to the "tubular" bodies. These are scattered, in masses, irregularly through the central substance; and, on closer examination, there are readily distinguishable in each mass two kinds of bodies, differing markedly in size and contents, though evidently primarily of the same morphological character.

From the appearances presented in section, as well as from teazed preparations, it is evident that, in each case, we have to do with specialized tubular masses of cells embedded in a tissue consisting of cells differing somewhat from the "nutritive cells" that form the body of the central mass, and more liberally permeated with bands of the adeniform tissue.

Let us first take the smaller kind. Through the greater part of their length they are simple tubes consisting of a sort of basement membrane, lined with small flattened granular cells, containing but little chlorophyll, about 5 m. in diameter. They appeared to end cæcally, and their lower part was filled with masses of cells having the following characteristics. Each little mass (Fig. 5) consists of a mother-cell of oval form about 40 m. long by 25 m. cross measurement, containing three daughter-cells. In the interior of these latter a curious change was in the process, resulting in the formation of a number of small spherules of a brilliant carmine colour about 2 or 3 m. in diameter, which in their turn break up into a number of minute rods of the same bright colour about 2 or 3 m. long by 1 m. or less in diameter. From the general characteristics of this organ, there can be little doubt that these rods come under the category of antherozoids, and that the organs themselves are antheridia.

The larger tubes are usually found in close proximity to the smaller kind, being commonly enclosed in the same sheath of small-celled tissue. Their cellular lining is usually much thicker than that of the antheridial tubes consisting usually of at least two layers of larger cells. The greater part of their length is usually filled up with mother and daughter cells, differing from those of the antheridial tubes in containing no coloured spherules or rods, and in the more abundantly granular character of their contents The portion of the section shewn in Fig. 6. appears to shew their mode of origin: here a cell of the lining has grown out into the lumen of the tube, and has produced a string of cells which has curled round on itself for a turn and a half in a circinate manner; the oldest cell in the middle of the helix is dividing into daughter-cells; some of these, however, were elsewhere met with of considerably greater size than those shewn here, which are obviously in the earliest stage of their development.

So far as could be made out, these tubes had no communication with the exterior, being rather of the nature of closed elongated sacs. Many were met with in a broken-down condition; and fertilization no doubt takes place by this retrogressive process setting free the ripe contents of the tubes, which, being thus liberated in close proximity, and suspended in the grumous matter resulting from the degeneration of the tube structure, can hardly fail to be brought into actual contact by the gentle osmotic currents which must always be in progress in such a structure as this.

This suposition is strengthened by the fact that young *Padina* fronds appear always to spring up, not in the neighbourhood of, but actually from the substance of the decaying prothallus. There can be little doubt, then, that the two kinds of tubular body are respectively of the nature of antheridia and archegonia. The rod-shaped produce of the smaller form make its antheridial nature little doubtful, and the produce of the larger kind is so much like the spores produced by directly sexual sea-weeds that there can, I think, be equally little doubt as to the *rôle* to be assigned to them.

There remain to be described the peculiar opaque bodies previously noted, and as to their nature no such relative certainty can be felt.

The surmise to which one feels most naturally led, is that they may be the fertilized spores in an early stage of development. They are, however, like nothing I have met with elsewhere either amongst algæ or in animal or vegetable histology. The bodies in question (Figs. 7 and 8) lie loose in the meshes of the adeniform tissue of the white peripheral layer of the prothallus. They are from 15 to 25 m. in diameter and of generally spherical form. In their fully developed form they appear to consist of one or more layers of minute colourless rods radiating from a common centre, so that their entire periphery is beset with minute blunt spines, on which account I have named them hedgehog cells. Intermediate stages can be traced between these and cells closely resembling the "spores" of the contents of the larger form of tubular body. They are quite white when seen by direct illumination, while their opacity renders them quite black when examined by transmitted light. They are confined to the under surface of the prothallus, where it comes in contact with the rock and are there very abundant; the lateral and upper parts of the peripheral layer of the thallus being composed of the adeniform tissue without any such contents.

The parts of the central substance between the groups of tubular bodies is filled up with very loose adeniform tissue enclosing in its meshes immense numbers of spherical cells containing abundant chlorophyll. These are from 12 to 15 m. in character, and probably fulfil a nutritive function.

The curious resemblance of the tube-bodies to an ovo-testis can scarcely be missed, and more than once caused me to reflect whether or not the structure might by any possibility be of animal origin. Repeated examinations, however, have assured me that this is not the case and that the body in question is an intermediate stage of the sea-weed in question. There are many points in connection with these bodies that require clearing up, but these can hardly be solved without continuous observation of the living plant. Like all surf-line weeds, *Padina pavonia* requires a very free supply of oxygen, and the conditions necessary for observing it in, if I may so speak, captivity are wanting on board ship; so that the solution of these points must, I fear, be reserved for other observers more favourably situated. Assuming, however, that the body which has just been described is really the prothallus of this weed, it would render it extremely probable that all algæ producing "spores" of but one kind go through some such cycle of changes; and a very large field of investigation appears in prospective as to the determination of the prothallus of each species. Some no doubt have been described as distinct species of algæ, as, assuming their existence, they can hardly have been entirely overlooked up to now.

EXPLANATION OF THE PLATES.

PLATE IV.

Fig. 1. *Padina pavonia*, nat. size. The sori are disposed in concentric lines consisting of a structureless flattened indusial sac and a number of pear-shaped sporanges. Tufts of paranemata disposed along their sides give to the sori a woolly appearance.

2. Vertical section of frond through a sorus showing sporanges and paranemata, × 200.

PLATE V.

Fig. 1. Prothallus of *Padina pavonia*, natural size.
,, 2. The same, × 10.
,, 3. Transverse section of same, × 20.
,, 4. Portion of the section showing male tubes in oblique section, × 300.
,, 5. Male mother-cell containing daughter-cells producing red-pigmented rods, × 400.
,, 6. Portion of the section shewing a female tube in transverse section, × 300.
,, 7. Adeniform tissue of lower surface of the prothallus containing "hedgehog" cells in its meshes, × 300.
,, 8. One of the "hedgehog" cells more carefully drawn, × 500.

IX.—*Notes on Indian* Rhynchota, No. 3.—*By* E. T. ATKINSON, B. A.

[Received June 15th;—Read July 1st, 1885.]

[The notes are taken as far as possible from the original descriptions, most of which are practically unprocurable by observers in India, or from Stål, Signoret, Butler, or Distant &c., where these authors have redescribed a species: the measurements of specimens not in the Indian Museum have been converted into millimetres from the recorded measurements of the several authors.]

The insects belonging to this section have been so little worked in India that the collector may feel sure of a rich harvest of new species. At the same time, we may take warning from the confusion in the results of the investigations into the European forms how very necessary it is, from the similarity in appearance and small size of the great majority of the species, to use the microscope more freely than has apparently hitherto been the practice in ascertaining the generic characters. We must wait some time before we can usefully attempt to do more than collect, compare, and fix the locality for the new forms of *Membracidæ* and *Jassidæ* which exist in such profusion in this country. In the meantime, these notes summarising what has been done in, as near as possible, the words of the authors, is a contribution to the work.

Family MEMBRACIDÆ, Stål.

Subfam. *Membracida*, Stål, Hem. Afric. iv. p. 83 (1866): Fieber, Rev. Mag. Zool. (3 sér.) iii. p. 332 (1875).

Subfamily CENTROTINA, Stål.

Centrotida, Stål, Hem. Afric. iv. p. 83: Ofvers. K. V.-A. Förh. p. 280 (1869): *Centrotina*, ibid. p. 727 (1870).

Scutellum distinct, produced backwards behind the metanotum, very often sinuated at the apex and furnished with acute apical angles. The scutellum is wanting in *Oxyrhachis*, which in Hem. Afric. iv. p. 84 (1866) is placed by Stål in his subfamily *Membracida* (*Membracina*), and in Ofvers. Kong. Vet. Aka. Förh. p. 280 (1869) in his subfamily *Centrotida* (*Centrotina*): in Hem. Fabr. ii. p. 47 (1869), it is again transferred to *Membracina*.

Genus OXYRHACHIS, Germar.

Silbermann's Rev. Ent. iii. p. 232 (1835): Fairmaire, A. S. E. F. (2 sér.) iv. p. 267 (1846); Stål, Hem. Afric. iv. p. 84 (1866); Ofvers. K. V.-A. Förh. p. 280 (1869); Fieber, Rev. Mag. Zool. (3 sér.) iii. p. 333 (1875).

Head perpendicular, frons a little elevated: thorax cornuted above the lateral angles, horns three-cornered; posterior process long, narrow, broad at the base, gradually narrowed, three-cornered, reaching the interior margin of the tegmina; beneath, posteriorly compressly-amplified, furnished with a ridge continued throughout the entire thorax: tegmina with five oblong, apical areas; wings with three apical areas: sides of the pro- and meso-stethium armed with a small lobe or tooth: tibiæ dilated (Stål).

1. OXYRHACHIS TARANDUS, Fabricius.

Membracis tarandus, Fabr., Ent. Syst. Suppt. p. 514 (1798).

Centrotus tarandus, Fabr., Syst. Rhyng. p. 19 (1803).

Oxyrhachis tarandus, Germar, in Silbermann's Rev. Ent. iii. p. 232 (1835): Burmeister, Handb. Ent. ii. (i.) p. 133 (1835): Amyot and Serville, Hist. Nat. Ins. Hém. p. 536 (1843): Fairmaire, A. S. E. F. (2 sér.) iv. p. 268 (1846), t. 4. f. 13: Walker, List Hom. B. M. ii. p. 503 (1851): Stål, Hem. Afric. iv. p. 84 (1866): Hem. Fabr. ii. p. 47 (1869): Fieber, Rev. Mag. Zool. (3 sér.) iv. p. 12 (1876).

Body obscure, dorsum fuscous; pronotum with two compressed horns, arched, obtuse, posteriorly subulate, longer than the abdomen; tegmina hyaline, veins fuscous: wings white; feet ferruginous (*Fabr.*). Long 7-8; breadth of pronotum, 3 millims.

♂. Brown-red; ♀, reddish-yellow or russet; vertex usually russet, sometimes brownish, with two small callosities prolonged to the ocelli, the angles straight: head, or towards the base only, black: the pronotum with a red or russet-yellow median ridge running from the anterior margin, little defined, to the space between the lateral protuberances, thence defined and prolonged throughout the entire posterior process: lateral protuberances of the pronotum turning outwards and backwards and sometimes slightly upwards, a little compressed, varying in size, tip acute or obtuse: the posterior process reaching to or extending beyond the apex of the tegmina by about the fourth of its length, more or less recurved towards the apex, narrowly lanceolate in its posterior half with a median keel on the sides, its lower edge finely serrated: feet with sunken dots, ciliated and setiferous: tegmina sordid hyaline, the two corneous patches at the base and the veins, russet-yellow (or fuscous-ferruginous): abdomen in the ♂, black; all the feet and the venter in the ♀, russet-yellow or reddish. Genitalia in the ♂, seen from above, transversely semioval; seen from the side, trapezoidal, briefly truncated behind and directed obliquely towards the base, and forwards in a weak arch: anal *styli* yellow, projecting on the sides, widened almost into a lozenge-shape, on a short narrow pedicel: anal tube short, cylindrical, brown: genital plates placed one opposite the other, brown, gradually contracted together behind; their tip spatuliform, rounded and relieved: body whitish pubescent.

♀. Last ventral arch obtusely emarginate: lateral plates (*gaîne*) broad, oval, acuminate behind; vagina (*tarière*) straight, a little longer than the *gaîne;* anal tube cylindrical, extending beyond the *tarière:* abdomen russet yellow (*Fieb.*, *Stal.*).

Reported from S. France, Egypt, Abyssinia, Senegal, Bengal. The Indian Museum possesses specimens from Calcutta.

2. OXYRHACHIS UNICOLOR, Walker.

Oxyrhachis unicolor, Walker, List Hom. B. M. ii. p. 509 (1851).

Piceous, densely fulvous pilose: head and pronotum thickly punctured: head transverse, not much broader than long, flat, slightly convex along the posterior margin, truncated in front, a little narrower than the pronotum between the shoulders, the pronotum ridged, rather low; rising vertically from the head, shoulders rounded, not prominent; horns above conical, prismatic, inclined forward, ascending, slightly diverging, their length equal to rather less than twice the breadth of the pronotum between them: posterior process ridged, reaching well beyond the tip of the abdomen, very slightly tapering from the base to the tip which is acute; very slightly undulating along the ridge; legs ferruginous; femora black; tibiæ dilated: tegmina almost without colour, long, narrow, lanceolate, punctured, ferruginous and partly tawny at the base; veins ferruginous, stout: wings colourless (*Walker*). Body long, 6: wings, 14½-15 millims.

3. OXYRHACHIS RUDIS, Walker.

Oxyrhachis rudis, Walker, List Hom. B. M. ii. p. 509 (1851).

Ferruginous: head piceous, transverse, flat, finely punctured, truncated and with a ferruginous spot on each side in front; not much broader than long, a little narrower than the pronotum between the shoulders; pronotum itself very roughly punctured, slightly ridged, rising vertically from the head, with the shoulders rounded not prominent; horns above very broad, conical, diverging, almost horizontal, slightly curved, disc of the inner side slightly concave towards the base; posterior side less than half the breadth of any other: posterior process keeled or ridged, extending well beyond the tip of the abdomen, tapering and slightly declining from the base to the middle where it is deepened and keeled beneath and from thence to the tip is serrated beneath and slightly inclined upwards: tibiæ dilated; tegmina and wings colourless: tegmina narrow, lanceolate, with a small pale brown spot on the angle of the posterior border; veins thick, ferruginous; three discoidal areolas (*Walker*). Body long, 6-7: wings, 13-14½ millims.

Reported from India.

4. OXYRHACHIS SUBJECTA, Walker.

Oxyrhachis subjecta, Walker, List Hom. B. M. ii. p. 504 (1851).

Smaller than *O. tarandus*, the dorsal horns shorter in proportion and less diverging, posterior process more inclined upwards and not serrated beneath. Black with a white pubescence : head transverse, subquadrate, flat, slightly impressed, finely punctured, not much broader than long, a little narrower than the pronotum, truncated and ferruginous in front : pronotum somewhat elevated in front, rather roughly punctured, rising almost vertically from the head with a ferruginous keel or ridge: shoulders of pronotum rounded, not prominent : horns above very broad, prismatic, conical, diverging, ascending, hardly curved downwards : posterior side much the shortest of all the sides ; length of the horns rather less than the breadth of the pronotum between them: posterior process mostly ferruginous, reaching well beyond the tip of the abdomen, inclined upwards, and ridged beneath, but not serrated from the middle to the tip: pectus and abdomen whitish pubescent : legs red; tibiæ dilated : wings colourless : tegmina tawny, punctured at the base and with a brown spot on the angle of the posterior border ; veins stout, ferruginous, four discoidal areolas (*Walker*). Body long 6; wings, 11½ millims.

Reported from India.

In *O. tarandus*, the pronotum is elevated in front, the posterior process is ridged and also serrated beneath, the length of the horns is rather more than twice the breadth of the pronotum between them, and there are four discoidal areas : in *O. subjecta*, the posterior process is not serrated beneath and the length of the horns is rather less than the breadth of the pronotum between them, otherwise as in *O. tarandus* : in *O. unicolor*, the pronotum is rather low in front and the length of the horns is as in *O. subjecta* : in *O. rudis*, the posterior process is keeled and serrated but there are only three discoidal areas.

Species of uncertain position.

5. MEMBRACIS FUSCATA, Fabricius.

Membracis fuscata, Fabr., Syst. Rhyng. p. 9, (1803) ; Fairmaire, A. S. E. F. (2 sér.), iv. p. 247, (1846).

Thorax foliaceous, rounded, fuscous ; streak before the anterior margin and posterior band, white (*Fabr.*). This species does not seem to have been rediscovered since it was described by Fabricius. Reported from India.

Genus HYPSAUCHENIA, Germar.

Silber. Rev. Ent. iii. p. 231 (1835) : Am. & Serv., Hist. Nat. Ins. Hém. p. 535 (1843) ; Fairmaire, A. S. E. F. (2 sér.) iv. p. 520 (1846) ; Stål, Hem. Afric. iv. p. 86 (1866) ; Ofvers. K. V.-A. Förh. p. 280 (1869).

Head almost triangular, trilobed at the extremity : prothorax a little shorter than the tegmina, without lateral horns, produced upwards in a compressed horn which is usually curved backwards and is bilobed at the tip : posterior process unilobed, slender, narrow at the base, narrower than the scutellum : tegmina free, slightly emarginate, extending much beyond the apex of the abdomen, very obliquely truncated at the apex, apical angle produced for some distance ; tibiæ simple.

6. HYPSAUCHENIA UNCINATA, Stål.

Hypsauchenia uncinata, Stål, Ofvers. K. V.-A. Förh. p. 283 (1869).

Obscurely ferruginous, ochraceous pubescent : dorsal horn of the pronotum bending a little forwards, posteriorly sublobate, acuminate and recurved at the apex ; tegmina punctured before the middle, pellucid behind the middle. ♀, long, 8 ; broad $2\frac{1}{3}$ millims.

Reported from N. E. India : the Indian Museum possesses a specimen (mutilated) from the Nága hills.

The anterior horn is much shorter and differently formed from other species of this genus ; pronotum punctulate, furnished anteriorly with a compressed dorsal horn, somewhat shorter than the posterior process, bending a little forwards, posteriorly roundly amplified a little above the middle, apex slender, acuminate and much recurved ; posterior process somewhat elevated behind the middle : tegmina fairly densely reticulated behind the middle (Stål).

7. HYPSAUCHENIA HARDWICKII, Kirby.

Centrotus hardwickii, Kirby, Mag. N. H. ii. p. 21, f. 5 *b* (1829).

Hypsauchenia hardwickii, Fairmaire, A. S. E. F. (2 sér.) iv. p. 520, t. 3, f. 20, 21 (1846) ; Walker, List Hom. B. M. ii. p. 681 (1851) ; J. L. S. Zool. x, p. 183 (1867).

Brownish black, sprinkled with short, decumbent, inconspicuous hairs ; legs (except the femora) paler than the rest of the body : pronotum minutely punctured, elevated above the head into a recurved quadrangular horn and terminating in a fork resembling a pair of concavo-convex, pedunculated, pointed leaves ; scutellum (posterior process) of the length of the body, punctured, acute and elevated into a rounded lobe, near the apex : tegmina naked, punctured, veined longitudinally (*Kirby*). Body long, 7-9 millims.

Reported from Nepál : the Indian Museum possesses specimens from Sikkim and Assam.

The *Hypsauchenia ballista* of Germar (Silb. Rev. Ent. iii. p. 231. 1835) *nec* Am. & Serv. (Hist. Nat. Ins. Hém. p. 535, t. 9, f. 5, 1843) is referred to *H. hardwickii* by Fairmaire (*l. c.* p. 520) and Am. & Serv.'s species *H. balista* is referred to the genus *Sphongophorus* from Mexico (*l. c.* p. 261). *S. balista*, Am. and Serv., differs from *H. ballista*, Germar, in the posterior process ending in an erect ensiform prolongation, which is wanting in *hardwickii* from India.

Genus LEPTOBELUS, Stål.

Hem. Afric. iv. p. 86 (1866) : Ofvers. K. V.-A., Förh. p. 280 (1869).

Frons without a basal lateral lobe, gradually narrowed : sides of the pectus unarmed: thorax with the disc elevated, the elevated part furnished on both sides with a slender horn, and posteriorly with a slender process, well apart from the body : scutellum elongate, longer than broad, gradually acuminated or much narrowed towards the apex, and with the apex slightly and narrowly obtusely or subsinuately truncated : exterior discoidal area of tegmina petiolated: wings with four apical areas: tibiæ very rarely dilated (Stål).

8. LEPTOBELUS DAMA, Germar.

Centrotus dama, Germar, Silbermann's Rev. Ent. iii. p. 258 (1835) : Fairmaire, A. S. E. F. (2 sér.) iv. p. 510 (1846), t. 3, f. 14 : Walker, List Hom. B. M. ii. p. 602 (1851).

Leptobelus dama, Stål, Berlin Ent. Zeitsch. p. 386 (1866) : Ofvers. K. V.-A. Förh. p. 284 (1869).

Black: thorax, posteriorly, with white scales; furnished with a short slender process on the dorsum anteriorly, turning upwards, armed at the apex on both sides with a spine which is produced outwards, and inflexed at the apex : scutellum elongated, spinose, white at the base : exterior discoidal area of corium petiolated (*Fairm.*). Body long, 9 millims.

Reported from India : the Indian Museum possesses a specimen from the Khasiya hills.

9. LEPTOBELUS GAZELLA, Fairmaire.

Centrotus gazella, Fairmaire, A. S. E. F. (2 sér.) iv. p. 510 (1846) : Walker, List Hom. B. M. ii. p. 602 (1851).

Leptobelus gazella, Stål, Berlin Ent. Zeitschr. x. p. 386 (1866) : Ofvers, K. V.-A. Förh. p. 284 (1869).

Cærulean black, thorax elevated in the middle, the elevated part trispinose, spines not inflexed, posteriorly not scaly with white. Closely allied to *L. dama*, from which it differs by its smaller size, the lateral spines shorter proportionately and slightly turned up : the prothorax is of a bluish black without a white patch posteriorly : the scutellum is elongated, white at the base : the tegmina are transparent, more yellow, black at the base ; exterior discoidal area of corium, petiolated. Body long 8 millims.

Reported from India.

10. LEPTOBELUS PALLIPES, Stål.

Leptobelus pallipes, Stål, Ofvers. K. V.-A.Förh. p. 284 (1869).

Black, distinctly punctulate : thorax anteriorly without a dorsal process : sides of thorax and pectus, also base of scutellum, densely ochreous-sericeous : tegmina sordidly vinaceous, base of clavus and entire costal area and radial area at the base and outwards beyond the middle, black, punctured: lateral horns of pronotum, slender, moderate, gradually acuminated, straight, turning outwards, above unicarinate, beneath bicarinate; posterior process slightly curved towards the base, thence straight, distant from the scutellum : exterior discoidal area of corium petiolated ; feet yellow-ferruginous. ♀ body long 5-5½ : breadth, 2 millims.

Reported from India.

Very like *L. curvispinus*, Stål, (Ceylon), lateral horns of thorax shorter, more slender, turning outwards ; very little upwards ; posterior process not reaching the apex of the scutellum and the frons narrrower at the apex (Stål).

11. LEPTOBELUS VARIUS, Walker.

Centrotus varius, Walker, List Hom. B. M. Suppt. p. 162 (1858).
Leptobelus varius, Stål, Ofvers. K. V.-A. Förh. p. 285 (1869).

Black, minutely punctured : head somewhat excavated between the eyes ; pronotum keeled, unarmed on each side, with a smooth shining spot on each side in front, shoulders somewhat acute : posterior process slender, acute, undulating, testaceous in the middle, not extending beyond the tip of the abdomen : legs piceous : knees, tarsi and tips of the tibiæ tawny : tegmina punctured towards the base, with various vitreous marks hindward, and with a large vitreous patch near the tip of the costa (*Walker.*) Body long 4¼ : exp. teg. 8½ millims.

Reported from Burma.

The species of this genus appear to be distributed as follows :—

A. Thorax furnished on the dorsum anteriorly with a short, slender process turning upwards and armed at the apex on both sides with a spine produced outwards, exterior discoidal area of corium petiolate : *L. damæ*, *L. gazella.*

B. Thorax anteriorly without the dorsal process, either cornuted or ridged above the lateral angles.

B. *a*. Posterior process of thorax distinctly curved towards the base : exterior discoidal area of corium petiolate : *L. curvispinus*, *L. pallipes*.

B. *b*. Posterior process of thorax straight, subundate, reaching the apical part of the scutellum, discoidal area of corium sessile, gradually much narrowed towards the base : *L. varius*, *L. auriculatus*, (Stål).

12. LEPTOBELUS SCUTELLARIS, Fabricius.

Centrotus scutellaris, Fabr., Syst. Rhyng. p. 19 (1803) : Germar, Silb. Rev. Ent. iii. p. 257 (1835): Fairmaire, A. S. E. F. (2 sér.) iv. p. 510 (1845) : Walker, List Hom. B. M. ii. p, 602 (1851).

Stål, in index to Hem. Fabr. (ii. p. 115), places a query after this species; and all that seems to be known is that it is reported from India.

13. LEPTOBELUS PARIA, Fairmaire.

Centrotus paria, Fairmaire, A. S. E. F. (2 sér.) iv. p. 513 : (1846) : Walker, List Hom. B. M. ii. p. 609 (1851).

Ferruginous : eyes projecting : horns a little divaricate, slender, acute, compressed : posterior process very slender, bordered on each side by the scutellum which is broad and white, as long as the abdomen : sides of the pectus white: feet yellowish: tegmina transparent (*Fairm.*) Long 6 millims.

Reported from India.

Genus XIPHOPÆUS, Stål.

Hem. Afric. iv. p. 87, 91 (1866) ; Ofvers. K. V.-A. Förh. p. 281 (1869).

Frons prominulous below in the shape of a tubercle; thorax cornuted above the lateral angles; posterior process much distant from the scutellum and abdomen, much curved from the base or geniculated near the base ; beneath, armed with small spines, at least towards the base, not dilated in the middle beneath; tegmina with five apical and two discoidal areas, none of which are petiolated: wings with four apical areas : tibiæ simple or very slightly dilated (Stål).

14. XIPHOPÆUS PILOSUS, Walker.

Centrotus pilosus, Walker, List Hom. B. M. ii. p. 606 (1851).
Xiphopœus pilosus, Stål, Ofvers. K. V.-A. Förh. p. 285 (1869).

Ferruginous, very thickly clothed with sordid white down: head punctured, short, transversely subfusiform, a little narrower than the thorax, with a metallic lustre in front, nearly twice as broad as long : face small : thorax punctured, deep in front, partly black, rising almost vertically from the head, slightly ridged, shoulders obtusely angular, somewhat prominent: horns above rather long, broad, irregularly prismatic, slightly diverging and inclined forwards; tips more diverging, almost trifurcate, slightly amplified; inner side and outer side much broader than the hinder side, angles slightly serrated; of the three forks or angles at the tip, the fore one is slightly obtuse, the middle one acute, and the hind one rectangular; hind horn stout and vertical for a short space from the base, then forming a right angle and extending backward much beyond the tip of the abdomen; hind part tawny, slender, tapering, very slightly undulating, with an acute black tip: pectus and abdomen piceous: legs tawny: a brown spot on the hind angle of each tegmen: veins tawny, here and there, brown (*Walker*). Body long 4¼: exp. teg. 9½ millims.

Reported from N. India.

Genus Acanthophyes, Stål.

Hem. Afric. iv p. 87, 89 (1866); Ofvers. K. V.-A. p. 281 (1869).

Thorax much elevated between the lateral angles, very often cornuted above the same angles; posterior process distant from the scutellum, bisinuate beneath, more or less amplified or lobed in the middle, between the sinus, with the amplified part reaching the dorsum of the abdomen or the apex of the scutellum: tegmina with five apical, two discoidal areas: wings with four apical areas: tibiæ simple (Stål).

15. Acanthophyes capra, Fabricius.

Membracis capra, Fabr., Ent. Syst. Suppt. p. 514 (1798).
Centrotus capra, Fabr., Syst. Rhyng., p. 20 (1803).
Acanthophyes capra, Stål, Hem. Fabr. ii. p. 50 (1869).

Body altogether fuscous, immaculate: horns of thorax, large, thick, obtuse; thorax posteriorly short, emarginate: tegmina fuscous (*Fabr.*). Ferruginous black or ferruginous, remotely flavescent-grey-sericeous, two small basal spots on scutellum and sides of pectus very densely sericeous: lateral horns of thorax depressed, truncated, bicarinate above. ♀: long with tegmina 6½; thorax broad, 3; exp. thoracic horns, 4½ millims.

Head between the eyes a little shorter than broad, beneath the eyes abruptly very much narrowed; frons gradually slightly narrowed, subtruncate, freely produced downwards for a distance: thorax punctured, armed on both sides anteriorly above the lateral angles with a depressed horn, very slightly narrowed towards the apex, truncated at the apex, bicarinate above and below; anterior apical angle of the horns round, posterior somewhat acute; posterior process distinctly carinate, very broadly sinuated in the middle above, a little amplified beneath in the middle, reaching the apex of the scutellum, very slightly decurved towards the apex: tegmina fuscous-ferruginous or ferruginous-grey, punctured at the base (Stål).

Reported from Tranquebar, India.

Genus LEPTOCENTRUS, Stål.

Hem. Afric. iv. p. 87, 90 (1866): Ofvers. K. V.-A. Förh. p. 281 (1869).

Frons more or less prominulous downwards: thorax cornuted above the lateral angles; posterior process slender, three-cornered, acute, emitted a little before the posterior margin of the thorax, altogether distant from scutellum and abdomen, not unless posteriorly touching the interior margin of the tegmina, not sinuated beneath nor amplified in the middle: scutellum emarginate at the apex; moderate: tegmina with five apical, two discoidal areas, none of them petiolated: wings with four apical areas: tibiæ simple.

16. LEPTOCENTRUS TAURUS, Fabricius.

Membracis taurus, Fabr., Syst. Ent. p. 676 (1775): Spec. Ins. ii. p. 317 (1781): Mant. Ins. ii. p. 244 (1787): Ent. Syst. iv. p. 14 (1794); Olivier, Enc. Méth. vii. p. 665 (1792).

Membracis rupicapra, Fabr., Ent. Syst. Suppt. p. 514 (1798).

Centrotus rupicapra, Fabr., Syst. Rhyng. p. 18 (1803).

Centrotus taurus, Fabr., Syst. Rhyng. p. 20 (1803); Germar, Mag. iv. p. 32 (1821); Silb. Rev. Ent. iii. p. 257 (1835): Fairmaire, A. S. E. F. (2 sér.) iv. p. 510 (1846); Walker, List Hom. B. M. ii. p. 602 (1851); ibid. Suppt. p. 158 (1858); J. Linn. S. Zool. i. p. 93 (1856); ibid. p. 163 (1857).

Membracis tricornis, Hardwicke, Zool. Journ. iv. p. 114, t. Suppt. 30, fig. *c. d. f.* (1828).

Centrotus terminalis, Walker, List Hom. B. M. ii. p. 604 (1851).

Centrotus vicarius, Walker, l. c. p. 605 (1851).

Leptocentrus taurus, Stål, Ofvers. K. V.-A. Förh. p. 491 (1862); Berlin Ent. Zeitsch. x. p. 386 (1866): Hem. Fabr. ii. p. 50 (1869).

Fairmaire makes *M. tricornis*, Hardwicke, a synonym for *L. taurus*, Fabr., to which Walker adds his own *C. vicarius* and *C. terminalis*, and Stål adds *C. rupicapra*, Fabr.

Head fuscous, eyes castaneous, a white spot before the eyes: thorax fuscous with two stout horns, a little arched, produced posteriorly, filiform: sides of pectus white: wings obscure: body fuscous (*M. taurus*, Fabr.). Body small, fuscous; thorax with three horns, the lateral thicker, obtuse or rather truncate, subdentate; the intermediate, posterior, recurved: tegmina fuscous hyaline; wings whitish (*M. rupicapra*, Fabr.). Fairmaire remarks that *C. taurus* is black with the scutellum and sides of the pectus white and the tegmina with the costa fuscous. Hardwicke describes his *M. tricornis* as head, thorax, and body black;

wings ash-grey, longer and broader than the body, and incumbent: thorax three-horned, two of which are placed in front behind the eyes, about as long as the thorax, strong, erect and curved outwards; the third horn rises from the posterior margin of the thorax, extending in a gentle arch the whole length of the body and tapering to the apex. Stål notes that the type has the lateral margins and apical spine of the scutellum sordid whitish. Walker's *C. terminalis* is thus described: "Black, clothed with tawny hairs; head and pronotum roughly punctured: head convex very short, transversely subfusiform, a little narrower than the pronotum, undulating along the hind border, retuse in front, on each side of the face whose hind border is semicircular and occupies much less than half the length of the face; clypeus prominent, retuse: pronotum thick in front rising vertically above the head, indistinctly ridged; shoulders very obtusely angular, not prominent; above them are two long, stout, prismatic, diverging, acute horns which are curved backwards, especially towards the tips; their sides are slightly concave, their inner and outer sides are of equal breadth, their hinder side is narrower; behind them the pronotum is armed with a long, slender, smooth, acute triangular horn which is slightly curved downwards and extends to the tip of the abdomen: abdomen above with hoary reflections: tibiæ pitchy; hind tarsi tawny: wings very pale lurid; a narrow pale brown streak on the fore-border near the tip of each tegmen; two discoidal areolas; veins tawny: wings colourless, veins black." Body long 6-8 millims.

Fairmaire notes that he cannot separate from this species smaller ones of which the horns are very acuminate and hardly recurved, and others in which the horns are relieved and oblique. *M. vicarius*, Walker, is one of those in which the horns are short.

Reported from India: the Indian Museum possesses specimens from Calcutta, Sikkim.

17. LEPTOCENTRUS REPONENS, Walker.

Centrotus reponens, Walker, List Hom. B. M. ii. p. 604 (1851): J. L. S. Zool. x. p. 183, (1867).

Centrotus antilope, Stål, Freg. Eug. Resa, Ins. p. 284 (1859).

Leptocentrus antilope, Stål, Ofvers. K. V.-A. Förh. p. 727 (1870).

Fuscous ferruginous: rudely punctured, sparingly covered with whitish down, head and thorax anteriorly more densely clothed; thorax anteriorly subreclinately sloped, armed on both sides with a horn, strong, long; produced somewhat upwards, recurved towards the apex, three-cornered; posterior process from its base distant from the abdomen, somewhat curved at the base, thence straight, equally thick, extending somewhat beyond the apex of the abdomen, three cornered with a high median ridge: tegmina weakly fuscescent-hyaline, veins fuscous. Size almost the same as that of *L. taurus*, but differs in being longer, proportionately narrower, anterior horns longer, more produced upwards, scutellum concolorous (Stål). Body long 9: broad 5 millims.

Reported from New Guinea, Timor, Philippines, Ceylon, India: the Indian Museum possesses specimens from Calcutta.

18. LEPTOCENTRUS SUBSTITUTUS, Walker.

Centrotus substitutus, Walker, List Hom. B. M. ii. p. 605 (1881).

In structure like the preceding: horns of thorax short as in var. *vicarius*, Walker, of *L. taurus*; pectus with a thick patch of pale yellow down on each side in front; legs black; tarsi pitchy; hind tarsi tawny; wings black; tips colourless; veins tawny. Body long 6¼: wings long 12½ millims. (*Walker*).

Reported from N. Bengal.

Genus CENTROTYPUS, Stål.

Hom. Afric. iv. p. 88 (1866): Ofvers. K. V.-A. Förh. p. 281 (1869).

Frons gradually narrowed from the base, without a lobe on both sides at the base: posterior process of thorax not sinuated on each side from the base to the scutellum, never distant from the scutellum, gradually narrowed, covering the whole or almost the whole of the scutellum; dorsum of thorax distinctly keeled, the keel not (or very obsoletely) continued forward through the thorax, which instead of a keel has a somewhat smooth line: sides of scutellum not prominulous, scutellum not or only a little, seldom twice, as broad as the base of the posterior process of the thorax: tegmina with five entire, oblong, apical areas; costal area punctured at the base, costal and radial areas abbreviated at the same distance or almost so from the base (Stål).

19. CENTROTYPUS FLEXUOSUS, Fabricius.

Membracis flexuosa, Fabr., Ent. Syst. iv. p. 12 (1794).

Centrotus flexuosus, Fabr., Syst. Rhyng. p. 18 (1803): Fairmaire, A. S. E. F. (2 sér.) iv. p. 516 (1846): Walker List Hom. B. M. ii. p. 611 (1851).

Centrotus anchorago, Guérin, Icon. Règne Anim. t. 59, f. 4 (1829-43).

Centrotypus flexuosus, Stål, Hem. Fabr. ii. p. 51 (1869): Ofvers. K. V.-A. Förh. p. 286 (1869).

Thorax punctured, cœrulean; with a stout horn on both sides, flat, acute, black, a little flexuose, posteriorly produced in a spine, longer than the abdomen: wings black, a spot on the slender margin whitish: body black (*M. flexuosa*, Fabr.).

Cœrulean black : lateral horns of thorax long, somewhat recurved, scarcely turning upwards, above unicarinate, hardly broader than the median part of the posterior process, acute : tegmina subvinaceous, ferruginous towards the apex, with the base and the broad costal limbus beyond the middle, blackish (Stål) ♀. Body long 10 : breadth of pronotum $3\frac{3}{4}$: exp. horns of thorax $8\frac{1}{2}$ millims.

Reported from India : the Indian Museum possesses specimens from Sikkim.

20. CENTROTYPUS ASSAMENSIS, Fairmaire.

Centrotus assamensis, Fairmaire, A. S E. F. (2 sér.) iv. p. 517 (1846).

Centrotus costalis, Walker, Ins. Saunders. Hom. p. 27 (1858).

Centrotypus assamensis, Stål, Ofvers. K. V.-A. Förh. p. 286 (1869) : Distant, J. A. S. B. xlviii. (2), p. 38 (1879.

Greenish black, blue on the horns : allied to *C. flexuosus*, Fabr. thoracic horns less dilated, ridged before and behind, more relieved : tegmina yellow, pellucid, with the external margin blackish brown, a brown patch at the internal angle (*Fairm.*). Long 11 millims.

Reported from Assam and Tenasserim ; the Indian Museum possesses specimens from the latter locality.

21. CENTROTYPUS OBESUS, Fairmaire.

Centrotus obesus, Fairmaire, A. S. E. F. (2 sér.) iv. p. 518 (1846) : Walker, List Hom. B. M. ii. p. 612 (1851) : Stål, Berlin Ent. Zeitsch. x. p. 386 (1866).

Centrotus malleator, Walker, List l. c. p. 612 (1851), Java.

Centrotus malleolus, Walker, List l. c. p. 613 (1851), Java.

Centrotus malleus, Walker, List l. c. p. 613 (1851), Ceylon.

Centrotypus obesus, Stål, Ofvers. K. V.-A. Förh. p. 286 (1869).

Cœrulean-black, shining : prothorax tumid and rounded anteriorly and between the shoulders (especially in ♀), deeply punctured : horns conical, slightly projecting, almost horizontal ; posterior process, sinuated, slender, slightly curved below at the tip, longer than the abdomen : scutellum white, short ; basal half of tegmina of a transparent yellow, rest brown, external border blackish (*Fairm.*). Long, 8-10 millims.

Reported from Java, Ceylon, India.

Genus COCOOSTERPHUS, Stål.

Hem. Fabr. ii. p. 51 (1869).

Body small, obovate : head with the eyes equal in breadth to the anterior part of the thorax, with the eyes, deflexed, somewhat transverse, slightly inflexed beneath the eyes, frons a little elevated, not freely prominent, with the apical margin a little prominulous: ocelli twice as distant from each other as from the eyes: thorax moderately convex, unarmed on both sides anteriorly, gradually narrowed behind the slightly prominulous lateral angles and gradually passing into the posterior process; the posterior process entire on both sides at the base, not sinuated, gradually acuminated, straight, slightly deflexed at the apex, equalling the apex of clavus, somewhat highly ridged, much depressed in the middle. No complete scutellum: mesonotum furnished on both sides at the apex with a spinule turning backwards. Tegmina short, not extending beyond the apex of the abdomen, gradually somewhat amplified towards the apex which is obliquely rounded, opaque and coriaceous at the base; exterior vein of clavus united with the commissure at some distance beyond the middle; corium emitting the ulnar and radial veins from the base, ulnar vein somewhat forked before the middle of the corium, two discoidal areolas or, if the areola behind the fork of the ulnar vein be included, three; the exterior discoidal areola stylated, stylus separating the interior (or intermediate) discoidal areola from the first apical area, five apical areas. Wings with three apical areolas. Feet moderate, tibiæ prismatic, anterior a little depressed: anterior trochanters unarmed within.

A curious genus allied to *Gargara*, Stål; but very distinct in having the thorax behind the lateral angles gradually passing into the posterior process which has no sinus at the base; there is no produced complete scutellum, but the mesonotum is armed at the apex with two very distant spines (Stål).

22. Coccosterphus minutus, Fabricius.

Membracis minuta, Fabricius, Ent. Syst. Suppt. p. 514 (1798).

Centrotus minutus, Fabricius, Syst. Rhyng. p. 22 (1803).

Scaphula (?) minuta, Fairmaire, A. S. E. F. (2 sér.) iv. p. 495 (1846); Walker, List Hom. B. M ii. p. 589 (1851).

Coccosterphus minutus, Stål, Hem. Fabr. ii. p. 51 (1869).

Minute: head and thorax black, scabrous with elevated dots: thorax subunarmed, produced posteriorly, attenuated, a little elevated before the apex, as long as the abdomen: tegmina obscurely whitish, somewhat spotted fuscous, black at the base; wings shorter, hyaline: body black (*Fabr.*). Black, flavescent-greyish-sericeous: head, thorax and tegmina remotely sprinkled with somewhat large granules: thorax furnished with a ridge or keel, obsolete anteriorly, very elevated in the posterior process, in its medium depressed part interrupted: tegmina palely greyish-flavescent, subpellucid, obsoletely dotted with white, veins here and there infuscate, granules and almost third basal part, black; black part punctured; ulnar vein running through this part greyish-flavescent (Stål).

♂. Body long 3¼: broad 2 millims.

Reported from E. India, Tranquebar.

Subfamily DARNINA, Stål.

Darnida, Stål, Ofvers. K. V.-A. p. 556 (1867); p. 250 (1869).

Genus HEMIPTYCHA, Germar (in part).

Fairmaire, A. S. E. F. (2 sér.) iv. p. 312 (1846): Stål, Ofvers. K. V.-A. Förh. p. 557 ((1867), p. 250 (1869).

Thorax without an impression above the lateral angles, much elevated anteriorly, furnished on both sides with a long horn, strong, curved, acute, turning upwards, reaching with the lateral margins of the posterior process the longitudinal vein of the clavus, covering part of the apex of the clavus and narrow interior posterior part of the corium, apical half or more very slightly deflexed; entire dorsum tectiform or compressly acute, sinuated above beyond the middle, behind the sinus gradually decreasing in height, equal to or extending a little beyond the apex of the tegmina; head obtusely triangular: ocelli a little more distant from the eyes than from each other.

23. HEMIPTYCHA CRUX, Linnæus.

Cicada crux, Linn., Syst. Nat. (ed. 10) i. p. 435 (1758): Mus. Lud. Ulr. p. 154 (1764).
Hemiptycha crux, Stål, Berlin Ent. Zeitsch. *x*, p. 389 (1866).

Fuscous-testaceous: thorax black, anteriorly obsoletely spinkled testaceous, behind the lateral horns broadly margined with yellow, this yellow margin narrowed backwards, extended beyond the middle of the posterior produced part: tegmina fuscous. Thorax distinctly punctulate, furnished with a very strong and long horn above the lateral angles, compressed, turning outwards and moderately upwards, at the apex obliquely truncated, anteriorly rounded, at the apex posteriorly acuminate, slightly amplified towards the tip; posterior produced part gradually acuminated, extending a little beyond the tip of the tegmina; apex itself very slightly recurved: dorsum seen from the side somewhat straight and with a distinct ridge, lateral margins straight (Stål). ♀, body long 18; exp. horns of thorax 17 millims.

Reported from India (*Linn.*).

Genus SCAPHULA, Fairmaire.

A. S. E. F. (2 sér.) iv. p. 494 (1846).

Head triangular, rounded at the tip: eyes very broad, prominent, ocelli contiguous: prothorax smooth, sometimes elevated, slightly rounded posteriorly: tegmina free, with posterior veins waved, one small discoidal; the internal extremity sometimes slightly covered by the prothorax: posterior tarsi longer than the anterior (*Fairm.*).

24. SCAPHULA SEMIATRA, Fairmaire.

Scaphula semiatra, Fairmaire, A. S. E. F. (2 sér.) iv. p. 494, t. iii. f. 18, 19; t. vii, f. 20 (1846); Walker, List Hom. B. M. ii. p. 589 (1851).

Brownish black, shining; prothorax somewhat elevated in the middle, terminated posteriorly by a defined, rounded border; tegmina free, dull black, posterior third transparent: abdomen beneath, anterior feet, knees, and tarsi yellowish; posterior feet blackish (*Fairm.*) Body long 6 millims.

Reported from Coromandel?

Family JASSIDÆ, Stål.

Jassida, Stål, Hem. Afric. iv. p. 82 (1866); Fieber, Kat. p. 8 (1872); Rev. Mag. Zool. (3 sér.) iii., pp. 337, 386, (1875).

Subfamily PAROPINA, Fieber.

Paropida, Fieber, Kat. p. 7 (1872); Rev. Mag. Zool. (3 sér.) iii, p. 384 (1875): *Paropides*, Sign. A. S. E. F. (5 sér.) ix, p. 47 (1879).

Genus SIGNORETIA, Stål.

Freg. Eug. Resa, p. 289 (1859).

Body elongate, subparallel: head with the eyes broader than the thorax, round in front, semilunated on the vertex, subconcave, furnished posteriorly with a high transverse ridge; frons large, convex, with a much elevated longitudinal ridge; ocelli placed in a small excavation in the margin of the base of the frons at the eyes: thorax shorter than broad, parallel, anteriorly semicircularly rounded and produced between the eyes, rounded behind, posteriorly convex, anteriorly semicircularly depressed, where it is furnished with two ridges before the apex, lying close to each other: scutellum small, triangular: tegmina longer than the abdomen with the longitudinal veins towards the apex, once joined by the transverse nervures, the intracostal longitudinal vein forked behind the middle: feet moderate, posterior tibiæ three-cornered, angles remotely spinose. Allied to *Paropia*: ocelli nearer the eyes, frons convex, ridged, thorax differing in shape, the suctellum very small (Stål).

25. SIGNORETIA MALAYA, Stål.

Thamnotettix malaya, Stål, Ofvers. K. V.-A. Förh. p. 192 (1855).
Signoretia malaya, Stål, Freg. Eug. Resa, p. 290, t. 4, f. 9, *a. b.* (1859).

Virescent-whitish, densely and roughly punctured; tegmina virescent whitish hyaline; entire clavus, space between the costa and the second longitudinal vein, also other veins on both sides, fairly roughly punctured (Stål). Long 7; broad, 1½ millims.

Reported from Malacca, Tenasserim (?).

Subfamily LEDRINA, Stål.

Ledrina, Stål, Ofvers. K. V.-A. Förh. p. 731 (1870): *Scarida*, Fieber, Kat. p. 7, (1872); Rev. Mag. Zool. (3 sér.), iii, p. 386, (1875).

26. LEDRA SERRULATA, Fabricius.

Ledra serrulata, Fabr., Syst. Rhyng. p. 24 (1803): Stål, Hem. Fabr. ii, p. 58, (1809).

Greyish or flavescent-greyish: body beneath and feet weakly testaceous flavescent or testaceous whitish: tegmina greyish pellucid behind the middle, near the base with a pallescent, broad, obsolete band; wings sordidly hyaline: the dorsum of the abdomen flavescent-sanguineous: thorax elevated posteriorly and furnished on both sides with a lobe, erect, produced forwards, crenulated posteriorly on the margin. Sometimes with two interrupted bands on the inferior part of the head and certain median marks on the thorax, black (Stål). ♀ Body long, 18; broad 5 millims. Stature of *L. aurita*, Linn. (Britain) head more roundly produced, lobes of thorax longer. Head somewhat shorter than the thorax, gradually distinctly amplified through a short space before the eyes, thence abruptly angulated and anteriorly much rounded, the ocellar tract impressed, the impressed part amplified forwards and gradually merging in the anterior disc, anteocular part remotely sprinkled with distinct granules. Lateral margins of thorax parallel at the apex, thence somewhat divergent backwards, two parallel ridges behind the middle anteriorly slightly divergent, obtuse, minutely tuberculate, and towards the sides a lobiform crest, very high, slightly bending forwards, remotely granulate, posteriorly crenulate. Scutellum gradually transversely depressed towards the middle, before the middle sprinkled with granules towards the sides, posteriorly much elevated, the elevated part posteriorly black and granulate. Tegmina gradually slightly amplified beyond the middle, thence rounded outwards: almost entire clavus and corium towards the base punctured and sprinkled with granules at intervals, veins here and there infuscate. Tibiæ above sparingly granulate.

Reported from Malacca, Tranquebar.

27. LEDRA MUTICA, Fabricius.

Ledra mutica, Fabricius, Syst. Rhyng. p. 25, (1803): Stål, Hem. Fabr. ii, p. 59, (1869).

Ledra fornicata, Walker, List Hom. L. M. iii, p. 815, (1851).

Ledra carinata, Walker, List l. c. p. 815, (1851).

Greyish mingled with fuscous or weak ferruginous and granulated, beneath palely sordid flavescent : head and thorax equal in length, the head obtusely angulated at the apex, the thorax posteriorly quadricarinate : dorsum of abdomen weakly sanguineous : clavus sometimes marked anteriorly with a large pale spot : wings sordid hyaline, sanguineous at the base. ♀, body long. 18 ; broad 4¾ millims.

Allied to *L. dilatata*, Walker, but narrower, head longer. Head very obtusely tectiform, much produced, furnished with a median wrinkle, running through it, and posteriorly with four longitudinal wrinkles, the exterior a little oblique ; somewhat roundly amplified before the eyes, thence gradually obtusely angulated towards the apex, gradually very obtusely roundly-narrowed, sprinkled with granules and small tubercles. Thorax hardly narrowed forwards, subsinuate before the middle on both sides, behind the middle gradually elevated backwards, remotely sprinkled with granules, posteriorly furnished with four parallel ridges. Scutellum with the apical part much elevated and longitudinally birugose, the wrinkles (*rugæ*) granulated. Tegmina gradually a little amplified beyond the middle, thence rounded externally, behind the middle more pellucid, towards the base sprinkled at intervals with granules, greyish, veins more obscure, here and there infuscate or palely ferruginous. Tibiæ above sprinkled with some granules (Stål).

Reported from Tranquebar, N. India, N. Bengal.

28. LEDRA DILATATA, Walker.

Ledra dilatata, Walker, List Hom. B. M. iii, p. 811, (1851) : Stål, Ofvers, K. V.-A. Förh. p. 495, (1862) ; Hom. Fabr. ii, p. 59, (1869).
Ledra scutellata, Walker, l. c. p. 812, (1851).
Ledra plana, Walker, l. c. p. 812, (1851).

Closely allied to *L. mutica*, Fabr. Testaceous, paler beneath : head and prothorax, with ferruginous tubercles : head broader than the thorax, very slightly arcuated, anterior margin rounded, each side somewhat angulated, hinder margin very slightly sinuate, weakly tricarinate, the lateral ridges short and oblique ; its length hardly half its breadth : thorax convex on the disc, furrowed across, very slightly convex along the anterior margin, with a pale band on the disc, which has five slight ridges, the middle one short : posterior margin concave in the middle, convex on each side : scutellum gibbous with two slight crests towards the tips : abdomen red above : tegmina whitish, very convex along the fore-borders towards the tips ; veins pale ferruginous with a few piceous tubercles towards the base : wings colourless : tibiæ with piceous tubercles, slightly widened and fringed (*Walker*). Body long 10½ : teg. 25 millims.

Reported from E. India.

29. LEDRA DORSALIS, Walker.

Ledra dorsalis, Walker, List Hom. B. M. iii, p. 810, (1851); Stål, Ofvers, K. V.-A. Förh. p. 495, (1862).

Ferruginous, testaceous beneath, head a little broader than the thorax: very slightly arched, rounded in front, obtusely angular on each side, slightly sinuate on the posterior margin; its length hardly half its breadth; three broad, low, rounded ridges on the vertex, the side pair oblique; face with three black stripes corresponding to the ridges above: shield roughly punctured, slightly convex in front, very concave on the hind border, armed with six crests, outer pair irregular, horizontal, and oblique; next pair vertical, very high, marked with black, convex above, perpendicular and forming right angles behind; inner pair slight, interrupted with two black dots on each towards the hind border, scutellum convex: abdominal appendages short: legs testaceous: tegmina ferruginous, tuberculate, especially towards the base, almost colourless towards the tips: wings almost colourless (*Walker*). Body long 21; teg. 37½ millims.

Reported from Silhat.

The following three species are of doubtful position:—

30. LEDRA PUNCTATA, Walker.

Ledra punctata, Walker, List Hom. B. M. iii, p. 824, (1851).

Testaceous, paler beneath: head and thorax broad, roughly punctured; head very short-conical, narrower than the thorax, not arched, hardly ridged, very slightly concave along the hind border, with irregular whitish reticulations; its length less than half its breadth; face with a furrow along each side: shield green on the disc, with irregular whitish reticulations in front and on each side, where it is slightly widened and angular: legs pale testaceous: tegmina almost colourless, punctured from the base to the tips, tinged with pale green and along the borders with pale brown; tips darker brown; veins very few: wings white (*Walker*). Body long, 7¼; teg. 15½ millims.

Reported from Malabar.

31. LEDRA LINEATA, Walker.

Ledra lineata, Walker, List Hom. B. M. iii, p. 830 (1851).

Stramineous, fusiform: head and thorax flat; head almost smooth, conical, almost as broad as the thorax, not arched nor ridged, with a slight rim, hardly sinuate along the hind border; its length less than its breadth; face flat on the disc, with very oblique and indistinct striæ on each side: shield minutely striated across; scutellum with a slightly arched transverse suture near the tip : tegmina whitish, semitransparent; veins bordered with a darker colour; wings colourless (*Walker*). Body long, 7¼ : teg. 10½ millims.

Reported from N. India.

32. LEDRA PUNCTIFERA, Walker.

Ledra punctifera. Walker, List Hom. B. M. Suppt. p. 249 (1858).

Greenish-testaceous (pale green? when alive); very minutely punctured, whitish testaceous beneath : head flat, short, conical, very slightly impressed on each side above, and with a very slight keel beneath : thorax with a very slight impression on each side : tegmina with ramose veins and with a black point in each disc towards the hind border : wings vitreous (*Walker*). Body long, 14½ : teg. 25 millims.

Reported from Darjeeling.

Genus LEDROPSIS, White.

A. M. N. H. xiv, p. 425 (1844).

Head with its prolongation longer than wide, parallel in front of the eyes, as wide as the thorax, then gradually curved to the tip, which is somewhat obtuse ; ocelli on the same line with the front of the eyes and rather more distant from each other than from the eyes : eyes large but not very prominent ; prolongation hollowed out beneath, with a spear-shaped elevated ridge running down the middle, the base of which, on the face between the eyes, is hollowed out : antennæ spring from a depression in front of the eyes beneath, 3-jointed, the terminal joint ending in a longish bristle : thorax rounded in front, very deeply notched behind, the posterior angles truncately rounded : tegmina with many inclosed cells at the end, the veins robust : body elongate, margined beneath : tibiæ of posterior feet not dilated, serrated behind (*White*).

33. LEDROPSIS OBLIGENS, Walker.

Ledra obligens, Walker, List Hom. B. M. Suppt. p. 251 (1858).
Ledropsis obligens, Stål, Ofvers. K. V.-A. Förh. p. 495 (1862).

Reddish, very elongate-subfusiform, testaceous beneath : head convex, elongate-conical, much longer than broad ; under side concave, with a very broad border, the middle compartment lanceolate, black towards the tip of the vertex : thorax convex : abdomen compressed, with a dorsal ridge : tegmina tawny, reticulated ; veins very numerous with some whitish marks : wings greyish-vitreous (*Walker*). Body long 12½ ; teg. 16½ millims.

Reported from India ?

Genus TITURIA, Stål.

Ofvers. K. V.-A. Förh. p. 158 (1865); Hem. Afric. iv. p. 102 (1866).

Body large, oblong: head foliaceous, clypeated, triangular, rounded at the apex, produced forwards and a little downwards, vertex flat; frons narrow, flat: face beneath the eyes, abruptly much narrowed, thence gradually narrowed, margins very slightly amplified: eyes small: ocelli placed behind the middle of the vertex between the eyes, more distant from the eyes than from each other: thorax and vertex in the same plane, somewhat sloped, the former sexangular, angulately amplified on both sides, lateral margins acute, anterior margin straight, posterior margin slightly sinuated: scutellum triangular: tegmina coriaceous, densely punctured, tectiform, reaching the apex of the abdomen, clavus very broad in the middle, corium triangular, obliquely or roundly truncated behind the clavus; veins irregularly anastomosed towards the apex, less elevated: feet somewhat short: anterior coxæ free; last tibiæ remotely dentated above. Allied to *Petalocephala*, (Stål).

34. TITURIA PLANATA, Fabricius.

Membracis planata, Fabr., Ent. Syst. iv. p. 11 (1794).

Ledra planata, Fabr., Syst. Rhyng. p. 25 (1803).

Epiclines planata, Am. & Serv., Hist. Nat. Ins. Hém. p. 578 (1843); Walker, List Hom. B. M. iii. p. 831 (1851).

Epiclines hebes, Walker, Ins. Saund. Hom. p. 100 (1858).

Petalocephala planata, Stål, Ofvers. K. V.-A. Förh. p. 501 (1862).

Petalocephala expansa, Stål, Ofvers. l. c. p. 158 (1865).

Tituria planata, Stål, Hem. Fabr. ii. p. 59 (1869).

Clypeus flat, triangular, entirely virescent, eyes oblong, fuscous: pronotum smooth, flat, virescent, produced on both sides in a flat point, strong, acute: tegmina virescent, immaculate; body virescent (*Fabr.*). Olivaceous flavescent turning into virescent; above with the prostethium densely and distinctly punctured; head above finely and sparingly punctured: costa sordidly flavescent: apex of the spines of the last tibiæ fuscous; head obtusely triangular, more than twice as broad as long; thorax much dilated on both sides, angles acute, the anterior margin of the dilated part about one third longer than the posterior margin, the latter infuscate; the last ventral segment in the ♀ deeply sinuated at the apex (Stål). ♀, body 18: breadth of pronotum 10 millims.

Reported from Malacca, India, Tenasserim.

Subfamily PROCONIINA, Stål.

Ofvers. K. V.-A. Förh. p. 733 (1870).

Genus TETTIGONIA, H. Geoffroy (in part).

Hist. Ins. p. 429 (1764): Signoret, A. S. E. F. (2 sér.) i. p. 13 (1852).

Signoret (in *l. supra c.*) reviews the history of the group, first established by Geoffroy, in his work describing the insects found in the neighbourhood of Paris, under the name *Tettigonia*. In 1794, Fabricius separated the same group in his Ent. Syst. (iv. p. 27) under the name *Cicada*, and in his Syst. Rhyn. (1803) formed from it the genera *Jassus*, *Flata*, and *Cixius*. In 1811, Latreille re-established *Tettigonia*, and, in 1821, (Mag. Ent. iv.) Germar reduced it by creating the genera *Gypona*, *Cœlidea*, and others. In 1825, Lepelletier de St. Fargeau and Audinet-Serville (Enc. Méth. x. p. 600) formed two divisions, *Tettigonia* for those in which the head is rounded beyond the eyes and *Proconia* for those in which the head is conical. In 1829, Latreille (Règne Anim. 2nd ed., ii, 221) separated *Ciccus* from *Proconia*, and, in 1832, De Laporte de Castelneau (A. S. E. F. i, p. 222) formed *Germaria* and *Rhaphidorhinus*. In 1835, Burmeister (Handb. ii, (i) p. 117) restored the *Tettigonia* of Latreille and Germar with four subdivisions, and, again in 1840, Blanchard (Hist. Nat. Ins. iii) admits divisions only. In 1843, Amyot and Serville (Hist. Nat. Ins. Hém. p. 569) admit *Tettigonia*, *Germaria*, *Ciccus*, *Rhaphidorhinus*, and *Proconia*, and add *Aulacizes*, *Diestostemma*, and *Acopsis*. In 1850, Spinola (Tav. Sin. Modena) created *Diedrocephala* and *Wolfella*, and, in the same year, Signoret created *Dilobopterus* (Rev. Zool. (2 sér.) ii, p. 284). In 1851, Fitch formed *Helochara* for an American species, and, in the same year, Walker created *Propetes*.

In 1852-54, Signoret (A. S. E. F. (3 sér.) i-iii.) keeps one genus and five groups, and notices some 396 species then recorded from all parts of the world. Stål, in 1869 (Hem. Fabr. ii, p. 59, note), includes the group in his subfamily *Jassida* and division *Proconiida*, preserving *Germaria*, *Ciccus*, *Diestostemma*, *Rhaphidorhinus*, *Proconia*, and *Tettigonia* and adding a number of his own genera. In 1870, Stål (Ofvers. K. V.-A. Förh. p. 733) raises the group to the dignity of a subfamily under the name *Proconiina*. In 1884, Taschenberg (Zeitsch. Nat. Wiss. Halle, p. 431) sinks the genera and reviews the whole as one genus with subdivisions running so closely the one into the other as not to afford good generic characters. After examining the figures given by Signoret, this appears to me to be the most reasonable solution of the difficulties connected with the arrangement of the insects belonging to this group, which now number nearly five hundred.

35. TETTIGONIA SEMICIRCULARIS, Signoret.

Tettigonia semicircularis, Signoret, A. S. E. F. (3 sér.) i, p. 348, t. 10, f. 5 (1853) Walker, List B. M. Suppt. p. 219 (1858).

Head rounded anteriorly, yellow, with two frontal bands united on the clypeus, white : clypeus and rostrum black : two half moons united on the vertex, a median band and on each side two spots, black : pronotum transverse with two bands, anterior one narrow and sinuated, posterior broad, uniting with the first, and on each side between them a transverse patch, black : scutellum with a semicircular band proceeding from the base, black : tegmina fuscous, with a farinose, powdery substance ; lateral margins transparent : abdomen black with the sides and border of the segments, yellow ; exterior margin pale, bordered with black, anus white : feet yellow. Long 5-6 millims.

Reported from Pondicherry.

36. Tettigonia pavo, Signoret.

Tettigonia pavo, Signoret, A. S. E. F. (3 sér.) i, p. 675, t. 22, f. 4 (1853) : Walker, List B. M. Suppt. p. 218 (1858).

Bluish-black : head rounded, above bluish-black, beneath yellow with the frons and vertex between the eyes depressed : prothorax anteriorly somewhat narrow, yellow, with five spots or patches, black, of which three are on the anterior margin and two, corresponding to two on the base of the scutellum, are on the posterior margin : tegmina red, brown at the tips and exhibiting two bluish circles formed of an easily removeable farinose powder, one of these circles is on the cubital disc near the scutellary angle and the other is at the tip, half in the red part of the tegmen and half in the brown tip : wings brownish : abdomen bluish-black with the margins of the segments beneath, yellow : anal appendage as in *T. ferruginea* : feet yellow. Long 15 millims.

Reported from Bengal.

37. Tettigonia ferruginea, Fabricius.

Cicada ferruginea, Fabricius, Ent. Syst. iv. p. 32 (1794) ; Suppt. p. 218 (1798) ; Syst. Rhyng. p. 62 (1803).

Proconia ferruginea, Walker, List B. M. iii, p. 783 (1851).
Tettigonia apicalis, Walker, List l. c. p. 736, China.
Tettigonia confinis, Walker, l. c. p. 736, China.
Tettigonia addita, Walker, l. c. p. 737, Java.
Tettigonia gemina, Walker, l. c. p. 737, Java.
Tettigonia obscura, Walker, l. c. p. 738, E. India.
Tettigonia duplex, Walker, l. c. p. 738, — ?
Tettigonia reducta, Walker, l. c. p. 739, Hong Kong.
Tettigonia longa, Walker, l. c. p. 740, Philippines.
Tettigonia immaculata, Walker, l. c. p. 740, Quito ?
Tettigonia confinis, Walker, l. c. p. 745, — ?

Tettigonia ferruginea, Germar, Mag. Ent. iv. p. 69 (1821) : Signoret, Rev. Zool. p. 176 (1853) ; A. S. E. F. (3 sér.) i, p. 676, t. 22, f. 5 (1853) : Walker, List B. M. Suppt. p. 218 (1858).

Fabricius describes this species thus :—"Head, thorax and scutellum spotted with black : tegmina red : wings white. Of median size : head glaucous, with band at the base of the rostrum, and dot on the frons and vertex, dull black : thorax sub-cinereous with an anterior spot and two posterior spots common to the scutellum, black : scutellum concolorous, with the two common spots at the base and one towards the apex, dull black : tegmina ferruginous, a little lighter at the tips : body and wings black." Signoret notes that the form of the anal appendage in the ♀ distinguishes this species. This is very large, deeply emarginate, covering a great part of the vulvar plates, more or less round on the sides and in shape like two approximated lobes. Walker describes his different species as varying from tawny to red-lead colour, testaceous, luteous or orange : the tips of the tegmina are black, lurid or brown : posterior margins of abdominal segments and tip of abdomen, red, tawny, luteous or ferruginous, so that the form of the anal appendage in the ♀ is the most steady character for distinguishing a species so variable in colour. Body long, 14-20 millims.

The Indian Museum possesses specimens from Sumatra, Tenasserim, Arakan, Sikkim, and Assam.

38. TETTIGONIA UNIMACULATA, Signoret.

Tettigonia unimaculata, Signoret, A. S. E. F. (3 sér. ii. p. 26 (1854) : Stål, Ofvers. K. V.-A. Forh. p. 734 (1870).

Tettigonia kinbergi, Stål, Freg. Eug. Resa, Ins. p. 288 (1859).

Whitish with yellow veins : head triangularly rounded in front with a black spot between the ocelli and on both sides, above the antennal margin, near the eyes : ocelli blackish and placed in a deep groove : basal band on thorax produced subtriangularly in the middle and two basal spots on the scutellum, black : pronotum very convex in front, straight behind above the scutellum, anteriorly transversly furrowed : tegmina fuscous or yellow-white with the streaks a little brown, costal half, whitish hyaline : abdomen and feet yellowish white ; vertex impressed on both sides. Allied to *T. albida*, Walker, from which it differs in its smaller size, narrower head, anteriorly more or less obtusely roundly-subangulated, in wanting the median black apical spot, in the thorax being more narrowed forwards, posteriorly a little broader than the head, and especially by the cavities on each side in front of the eyes in which are inserted the ocelli (*Sign.*, Stål) ♀ Body long, 5 : broad, 1½ millims.

Reported from Philippines, Malacca, India.

39. TETTIGONIA BELLA, Walker.

Tettigonia bella, Walker, List Hom. B. M. iii, p. 778 (1851) : Signoret, A. S. E. F. (3 sér.) ii. p. 10, t. 1, f. 8 (1854).

Black, striated and spotted yellow; head as broad as the thorax, angularly rounded in front, somewhat concave posteriorly; vertex with a stripe, a band on the posterior margin and a curved stripe on each side, frons and face with spots on each side and some larger marks in the middle, yellow; three pair of large contiguous luteous spots on the head beneath, one of these on the clypeus: thorax black, with a curved yellow band on each side: scutellum black: tegmina black, with eight yellow patches or spots; two oblique, basal; two sutural forming a patch common to the two tegmina and four marginal; of the latter those on each side nearer the base, four times longer than the others, tips lurid: abdomen black or purple, tawny at the tip beneath; legs testaceous, anterior femora marked with black: wings brown, irridescent, pale gray towards the base. In some cases the marks on the tegmina are oblong angular, more like longitudinal bands than spots (*Sign.*, *Walk.*). Long 5½-6; teg. 12½ millims.

Reported from N. India, Silhat.

40. TETTIGONIA ASSAMENSIS, Distant.

Tettigonia assamensis, Distant, Ent. M. M. xvi, p. 203 (1880).

Head pale yellow, with a black fascia occupying the space between the ocelli; pronotum creamy white, the lateral margins carmine and six black spots situated transversely, two smallest near anterior margin and the four larger across the disc. Scutellum pale yellow with three black spots, two basal and one subapical: tegmina pale creamy white with a broad longitudinal subcostal carmine band, commencing near the base and extending to about the middle; a black narrow oblique band nearly crossing the tegmina at the base and at commencement of the carmine band and five dark fuscous spots situated, one in centre of carmine band, three wide apart, longitudinally on the disc, and one at the marginal apex of the coriaceous portion: wings dark fuscous with the apical borders broadly creamy white: abdomen above pitchy, underside of body pitchy; legs luteous and tarsi pitchy; face orange yellow with a large crescent-shaped black fascia about its centre and a small black spot at the base: the head is rounded in front, much broader than long, and transversely channelled on the disc (*Distant*). Body long, 13 millims.

Reported from Assam.

41. TETTIGONIA EXTREMA, Walker.

Tettigonia extrema, Walker, List Hom. B. M. iii, p. 761 (1851): Signoret, A. S. E. F. (3 sér.) i, p. 663, t. 21. f. 4 (1853): Stal, Ofvers. K. V.-A. Förh. p. 495 (1862).

Euacanthus extremus, Distant, Scient. Res. 2nd Yarkand Mission, p. 15 (1879).

Pale yellow: head luteous; vertex semicircular in front, hardly concave on the posterior margin, with a slight ridge on the disc which is mostly occupied by a black mushroom-shaped patch of which the stalk rests on the posterior margin between the ocelli; face smooth, shining, with a slight ridge and on each side with indistinct oblique striæ: thorax with a median obconical patch and a rounded spot on each side, also scutellum and abdomen, brownish black: tegmina yellow with an elongated subtriangular blackish-brown stripe towards the interior margin and a similar stripe along the costa almost to the apex, gradually much amplified towards the apex and itself striped paler: wings dark brown (*Walk.*, *Sign.*) Body long 6½; teg. long 13½ millims.

Reported from N. India, Murree.

42. TETTIGONIA QUADRILINEATA, Signoret.

Tettigonia quadrilineata, Signoret, A. S. E. F. (3 sér.) i, p. 669, t. 21, f. 12, (1853): Walker, List Hom. B. M. Suppt. p. 218 (1858).

Head, thorax, and scutellum yellow, with two median stripes from the vertex to the posterior margin of the thorax, a fine line between these stripes on the vertex, a stripe on the lateral borders of the thorax, and three spots on the scutellum, dark brown: tegmina red with interrupted narrow longitudinal black lines, irregularly disposed in rows, tips pale. Long 12 millims.

Reported from E. India.

43. TETTIGONIA RUBROMACULATA, Signoret.

Tettigonia cardinalis, Walker (*nec* Fabricius), List Hom. B. M. iii, p. 744 (1851).

Tettigonia rubromaculata, Signoret, A. S. E. F. (3 sér.) i, p. 668, t. 21, f. 11 (1853) Walker, List. l. c. Suppt. p. 218 (1858).

Above deep black: head with an irregular angular black mark on the vertex, including a subquadrate black mark which proceeds from the hind border: face flat with two black stripes which unite on the clypeus, sides tawny; rostrum piceous: thorax with a transverse band and lateral bands, red: scutellum red with two triangular spots, their bases resting on the anterior margin and a sagittate mark near the apices of those spots, black: tegmina black with a number of uninterrupted longitudinal red streaks, the ends of most of which on each tegmen meet the ends of the corresponding streaks on the other tegmen: wings with a metallic tinge: tip of abdomen red; legs red, feet tawny (*Sign.*). Long with teg. 12-14 millims.

Reported from Nepál: the Indian Museum possesses specimens from Sikkim and Sibságar (Assam).

44. TETTIGONIA OPPONENS, Walker.

Tettigonia opponens, Walker, List Hom. B. M. iii, p. 757 (1851): Signoret, A. S. E. F. (3 sér.) i, p. 667, t. 21, f. 10 (1853).

Black: head and thorax slightly convex, head bright orange, concave along the posterior margin, more convex in front, with two clavate stripes and a spot between the tips of the stripes, black; beneath pale yellow, twice broader than long; face oval with a flat pale orange disc, a black stripe along two-thirds ef each side is united to a black stripe on the clypeus, which is ridged and slightly compressed; rostrum pale yellow: thorax with a broad orange band which is sometimes half interrupted on the hind border and is waved along the fore border near each side of which it includes a little black cross streak, also a large subquadrate orange spot whose hind border is notched on each side near the tip of the scutellum which is tawny; legs pale yellow: tegmina dark grey with three orange stripes, costal and median united at the base, interior hardly extending beyond the middle, veins brown (*Walk.*, *Sign.*). Long 12 millims.

Reported from N. India.

Subfamily ACOCEPHALINA, Signoret.

Acocephalidæ, Fieber, Kat. p. 10 (1872): *Acocephalides*, Puton, Signoret, A. S. E. F. (5 sér.) ix, p. 47 (1879).

45. ACOCEPHALUS STRAMINEUS, Walker.

Acocephalus stramineus, Walker, List Hom. B. M. iii, p. 847 (1851); Stål, Ofvers. K. V.-A. Förh. p. 494 (1862): Signoret, A. S. E. F. (5 sér.) ix, p. 88 (1879).

Bythoscopus stramineus, Distant, Scient. Res. 2nd Yarkand Miss. p. 18 (1879).

Bythoscopus indicatus, Walker, List l. c. Suppt. p. 266 (1858).

Pale testaceous; head slightly rugose, a little narrower than the thorax, rounded and almost semicircular in front, less sinuate behind; about four times broader than long; vertex longer in the middle than on the sides; two black dots on the anterior border which forms a slight rim; face flat, broad, punctured: thorax transversely striated: scutellum very slightly punctured: tegmina almost colourless, punctured nearly to the tips, pale testaceous towards the base: wings colourless (*Walker*). Body long, 9½; teg. 21 millims.

Reported from Celebes, Java, N. China, Sind valley.

Genus HECALUS, Stål.

A. S. E. F. (4 sér.) iv, p. 65 (1864): Hom. Afric. iv, p. 113 (1866): Signoret, A. S. E. F. (5 sér.) ix, p. 266 (1879): includes *Glossocratus*, Fieber (Rev. Mag. Zool. (3 sér.) ii, p. 403, 1875).

Body oblong or elongate, depressed: head somewhat large or somewhat so produced, apical margin acute, more or less broadly foliaceous: face dilated, somewhat deeply sinuated below the eyes; frons a little convex: eyes small or moderate: ocelli placed on the apical margin of the head or at or near the eyes: thorax transverse, very obtusely rounded at the apex: scutellum triangular, a little broader than long: tegmina almost as long as the abdomen, margined at the apex, valvate behind the clavus, with five apical areas: feet moderate, posterior tibiæ very spinose. Allied to *Siva*, Stål, but differs in the head larger, more produced, margin foliaceous (Stål).

46. HECALUS SULCATUS, Fieber.

Glossocratus sulcatus, Fieber, Verh. K. K. Zool.-bot. Gesell. Wien. xvi, p. 513, t. 7, f. 13 (1866).

Hecalus sulcatus, Signoret, A. S. E. F. (5 sér.) ix, p. 272, t. 8, f. 28 (1879).

Sordid yellow: vertex parallel, parabolic in front, angles very obtusely rounded: prothorax with four elongated cavities in front, finely striated transversely behind: tegmina transparent, as long as the abdomen: veins strong, yellowish, not margined; a blackish dot at the point of the clavus: abdomen above with two bands of small brown patches, two at the base of each segment: feet entirely sordid yellow, unicolorous: ventral segments parallel, median lobe obtusely salient, sides sinuated (*Fieber*). ♀, body long, 11 millims.

Reported from E. India. Signoret considers this species to be probably one with *H. parva*, Walker (List iii, p. 828), though he gives the latter also with a ? as a synonym possibly of *H. paykulli*, Stål, who, however, makes it a *Selenocephalus* in Ofvers. K. V.-A. Förh. p. 494 (1862).

47. HECALUS PAYKULLI, Stål.

Petalocephala paykulli, Stål, Ofvers. K. V.-A. Förh. p. 252 (1854).

Hecalus paykulli, Stål, A. S. E. F. (4 sér.), iv, p. 64 (1864): Signoret, ibid. (5 sér.) ix, p. 270 (1879), t. 7, f. 26.

Sordid whitish-yellow, smooth, shining, clouded with brown on the vertex, the length of the median line, and transversely on the prothorax, the tegmina and the veins of the same colour but with a brown line on each side. Head defined on the margin only, one and half times longer than the prothorax, as long as broad between the eyes, angularly rounded, the sides almost parallel above the eyes, then forming an angle at the tip; two excavations on the vertex on each side. Frons convex with a foliaceous border anteriorly, grooved on the sides, border concave above the clypeus which is itself broader at the base than at the tips but showing its greatest breadth in the middle, carinate in its median part. Rostrum very short. Genæ with the tip oblique from the clypeus to the eye forming a very acute angle, concave, sinuous towards the clypeus then emarginate, concave near the eye. The prothorax a little more than twice broader than long, finely striated transversely in the posterior half and with several less marked impressions anteriorly. Tegmina opaque with four discoidal areas of which two are anteapical, five apical areas and three in the marginal space; a black dot occurs at the tip of the claval angle. Wings hyaline with the third sector reunited at the internal branch of the bifurcation of the second sector, then bifurcate and forming a long angular cell. Pectus and abdomen yellow: the latter a little deeper towards the base of the dorsal segments. ♂ has last segment of the abdomen hardly longer than the preceding, apical margin straight; a very small genital appendage; genital plates very narrow at the tip almost as long as the hypopygium and pubescent on the sides; the hypopygium a little broader and pubescent, the anal tube is surrounded by it and extends beyond it by very little. The ♀ has the last segment twice as long as the preceding, convex at the superior margin, angular in the middle and weakly sinuated on each side; the genital appendages or valvules are more than twice as long as the preceding and the oviduct extends beyond them by about one-third (*Signoret*). Stål writes :—Shining, sordid whitish-yellow; head (eyes excepted) almost equally long and broad, longer by half than the thorax, anteriorly slightly narrowed, smoothish: tegmina opaque; eyes fuscous. ♂ Body long 5; broad, hardly 2 millims: ♀, body long 6; broad, 2 millims: Stål gives ♀ long $8\frac{1}{2}$; breadth thorax 2 millims.

Reported from China, Senegal, (Australia ?), Silhat.

Genus THOMSONIELLA, Signoret.

A. S. E. F. (5 sér.) x, p. 52 (1880).

Separated from *Hecalus*, Stål, by the presence of six discoidal areolas. Body depressed: head prolonged in front, foliaceous on the anterior margin of the vertex, with a groove throughout its entire length, vertex depressed, also the frons, the latter with the grooves and lateral sutures extending to the anterior border of the head: genæ sinuated, rounded in the middle: the lores occupying the entire space between the margin of the genæ and the frontal suture: sides of clypeus almost parallel, rounded at the tip, one and half times longer than broad: prothorax transverse, almost broader than the head with the eyes: tegmina transparent hyaline with a narrow marginal limbus: rest as in *Hecalus* (*Signoret*).

48. THOMSONIELLA KIRSCHBAUMII, Stål.

Hecalus kirschbaumii, Stål, Ofvers. K. V.-A. Förh. p. 737 (1870).

Thomsoniella kirschbaumii, Signoret, A. S. E. F. (5 sér.) x, p. 52, t. 1, f. 44 (1880).

Pale yellow, shining, with a dot at the tip of the clavus and on the middle of the first apical area, black : anterior margin of vertex blackish. Head a little shorter than broad between the eyes, the anterior margin weakly angularly rounded and reflexed, vertex concave, ocelli in the groove very close to the eyes. Frons convex, almost as long as broad, the sides much rounded : genæ broad with the angle very obtusely rounded. Prothorax convex anteriorly, concave behind, the lateral margins very slightly convex, almost parallel ; finely, transversely striated. Clypeus with the sides parallel, rounded at the tip. Tegmina rounded at the tips with four broad apical and six discoidal cells, the sixth comprising a small hexagonal cellule with equal sides before the third apical cell; there is also a supplementary cellule ; limbus very narrow, a transverse vein between the two veins of the clavus. Abdomen long, the last segment (♀) twice as long as the penultimate with the margin sinuous, emarginate in the middle and furnished with a rounded median lobe ; valvules one half longer and the oviduct extending beyond them by a third. ♀, body long, 6 ; broad, 2 millims.

Reported from Philippines, Ceylon, India.

Resembles *P. wallengrenii*, Stål, but differs in the more rounded head, in the number of discoidal cellules, and in the groove on the border of the head (*Sign.*).

Genus SELENOCEPHALUS, Germar.

Silbermann's Rev. Ent. i, p. 180 (1833) : Burmeister, Handb. ii, (i), p. 111 (1835) : Amyot and Serville, Hist. Nat. Ins. Hém. p. 583 (1843) : Stål, Hem. Afric. iv, p. 108 (1866) : Fieber, Rev. Mag. Zool. (3 sér.) iii, p. 399 (1875).

Body oblong : head short, broadly rounded at the apex, apical margin with a furrow : vertex flat, horizontal : face dilated, depressed at the base, lateral margins slightly sinuated beneath the eyes : ocelli placed in the furrow of the apical margin of the head at or near the eyes : thorax transverse, rounded anteriorly : scutellum a little broader than long, triangular : tegmina extending beyond the apex of the abdomen, membranous, margined at the apex, valvate behind the clavus, with 4-5 apical areas : feet moderate, posterior tibiæ, a little compressed, very spinose (Stål).

49. SELENOCEPHALUS EGREGIUS, Stål.

Selenocephalus egregius, Stål, A. S. E. F. (4 sér.) iv, p. 66 (1864) : Signoret, ibid. (5 sér.) x, p. 62, t. 2, f. 52 (1880).

Light olive green, smooth ; vermillion spots on the head, prothorax and scutellum, glossy. Head very little broader than the prothorax, rounded in front ; vertex not longer in the middle than towards the eyes, with a biarcuated band of vermillion, margin with a slight groove, ocelli a little distant from the eyes; frons with the sutures concave, then convex at the tip, weakly impressed in front. Clypeus one and half times longer than broad, spatuliform; lores much rounded; genæ broad, tip convex, a little sinuate in front of the subocular piece. Prothorax two and half time broader than long, thrice longer than the vertex and with a vermillion band in front which starting from the middle of the anterior margin proceeds obliquely towards the middle of the lateral borders where it ends in a round spot. Scutellum broader than long with four round dots at the base, two lateral towards the transverse stria and the tip, vermillion. Tegmina hyaline golden-yellow with the side strong and vermillion up to beyond the middle, veins blackish, the transverse blacker and with two lateral spots along the border, three at the suture and the extremity, black. Wings slightly infuscate with a lighter space in the supplementary cellule: body and feet yellow olive with deeper shades at the base of the abdominal segments: last ventral segment in ♀ scarcely longer than the preceding, emarginate in the middle with a median lobe, the sides very oblique, trilobate: valvules thick, round, pubescent at the extremity; hairs yellow at the base, black at the tip: oviduct blackish just extending beyond the valvules (*Sign.*). ♀, body long, 8 millims.

Reported from Burma.

50. Selenocephalus cultratus, Walker.

Ledra culobata, Walker, List Hom. B. M. iii, p. 827 (1851).
Ledra cultrata, Walker, l. c. iv, p. 1159 (1851).
Selenocephalus cultratus, Stål, Ofvers. K. V.-A. Förh. p. 494 (1862).

Testaceous, almost fusiform; head conical, as broad as the thorax, shagreened, very slightly arched, very slightly concave along the hind border, with a very indistinct middle ridge, on each side of which there is a very slight furrow; its length a little less than its breadth; sides slightly angular; fore-part of the underside with slight diverging ridges which are at right angles to the slight oblique ridges on each side of the face; a piceous spot in front of each eye: ocelli near the hind border: thorax very slightly convex, hardly striated transversely, indistinctly impressed on each side; scutellum with a slight arched transverse suture near the tip: abdomen as broad as the thorax with seven slight black stripes: legs marked with black: tegmina pale testaceous, not punctured: wings colourless (*Walker*). Body long 10; teg. 14½ millims.

Reported from India.

Genus Petalocephala, Stål.

Stål, Ofvers. K. V.-A. Förh. p. 266 (1856); Hem. Afric. iv, p. 103 (1866).

Body very oblong or a little elongate, depressed: head clypeated, foliaceous, produced anteriorly; vertex somewhat flattish; face beneath the eyes abruptly very much narrowed, thence gradually, margins very slightly defined; frons small, narrow, flattish: eyes small: ocelli situate towards the base of the vertex, more distant from the eyes than from each other: thorax transverse, sexangular, not or only very slightly narrowed forwards, lateral margins acute, anterior-lateral much longer than posterior-lateral, anterior margin slightly rounded: scutellum triangular, subequilateral: tegmina subcoriaceous, pellucid, densely punctured, tectiform anteriorly conjointly convex, clavus very broad before the middle, corium obliquely rounded at the apex, veins irregularly anastomosed towards the apex, less distinct: feet somewhat short; first coxæ free; last tibiæ above remotely dentated. Type *Petalocephala bohemani* (Stål).

51. PETALOCEPHALA CHLOROCEPHALA, Walker.

Ledra chlorocephalus, Walker, List Hom. B. M. iii, p. 825 (1851).
Petalocephala chlorocephala, Stål, Ofvers. K. V.-A. Förh. p. 494 (1862).

Testaceous, paler beneath, almost fusiform; head and thorax thickly punctured; head flat, conical, as broad as the thorax, very slightly arched, very slightly concave along the hind border, green in front with a median ridge; its length a little more than half its breadth; three ridges beneath, the middle one tapering to the fore border, the side pair curved outward: thorax almost flat, shield tinged with green on each side of the hind border: legs pale testaceous: tegmina almost colourless, testaceous towards the base, brown at the tips, with a small black spot in each disc: wings colourless (*Walker*). ♂, body long, 10; teg. 20 millims.

Reported from N. India.

Genus SIVA, Spinola.

Gen. Ins. Artr., p. 167 (1852): Stål, Hem. Afric. iv, p. 112 (1866): Signoret, A. S. E. F. (5 sér.) x, p. 197 (1880).

Body very oblong, somewhat depressed, above slightly convex: head narrower than the thorax, short, rounded anteriorly or obtusely rounded subangularly, anterior margin somewhat acute but not foliaceous: vertex horizontal, flat, about twice broader than the eyes; face dilated, frons and clypeus somewhat flat; frons longer than broad; clypeus spatuliform; genæ broad with the angle more or less angular and more or less emarginate: ocelli placed at the eyes on the anterior margin of the head: thorax transverse, narrowed forwards, twice broader than long, slightly rounded at the apex, almost straight above the scutellum, lateral margins acute: scutellum triangular, a little broader than long: tegmina barely extending beyond the tip of the abdomen, tip narrow, irregularly veined: feet moderate, last femora compressed, last tibiæ very spinose. Allied to *Selenocephalus.*

52. Siva strigicollis,* Spinola.

Siva strigicollis, Spinola, Tav. Sinot. p. 127 (1852): Signoret, A. S. E. F. (5 sér.) x, p. 198, t. 6, f. 64 (1880).

Selenocephalus costalis, Stål, Freg. Eug. Resa, Ins. p. 290 (1859): A. S. E. F. (4 sér.) iv, p. 66 (1864) ♀.

Siva costalis, Stål, Ofvers. K. V.-A. Förh. p. 736 (1870) ♀.

Very pale yellow with two black spots on the tip of the vertex and one at the tip of each clavus: head and pronotum striated transversely. Head narrower than the pronotum, round in front, thickened and reflexed, with two small black median spots, a median line and slight transverse striæ; breadth between the eyes a little smaller than the eyes together: face transversely striated, stronger and more oblique on the sides: frons longer than broad, flat at the base, more convex at the tip, the grooves and base of a brighter citron yellow: genæ with parallel circular streaks on the upper border which is circular, slightly sinuate beneath the eyes, the portion below the eyes and antennæ, glossy: clypeus twice longer than broad, broadly spatuliform at the tip, transversely striated and a little carinate at the base: lores longer than broad. Pronotum twice broader than long, grooved strongly and almost parallel, anterior border slightly convex, sides oblique and posterior border almost straight, angles oblique: scutellum broader than long with three spaces bounded by the angles, those at the base almost glossy, that at the tip, strongly transversely striated. Tegmina rugose, punctured, longer than the abdomen, veins strong: wings large, milky. Pectus yellow with paler spaces; feet yellow, femora flat, posterior tibiæ very spiny: abdomen uniform yellow.

♂ last ventral segment much larger than the penultimate but less broad, pubescent, almost square with the apical margin almost straight a little sinuate in the middle, angles round; covering almost entirely the plates of the genitalia and of half the hypopygium; the former very narrow, slightly pubescent; the latter forming two valves irregularly rounded at the tip and armed on the disc and sides with a few spiny hairs.

♀ last ventral segment a little longer on the sides than the penultimate not longer in the middle, lateral angles, acute, round at the tip, the middle concave, without sinuosities: the valvules four times longer, hardly pubescent, extending a little beyond the oviduct which is short and enclosed by the dorsal tip of the valvules, the anal tip visible from below, invisible from above (*Sign.*). Body long, 10-11 millims.

Reported from Philippines, Coromandel, India.

Genus DRABESCUS, Stål.

Subgenus, Ofvers. Kong. Vet. Aka. Förh. p. 738 (1870): *Dabrescus*, Signoret, A. S. E. F. (5 sér.) x, p. 207 (1880).

Ocelli remote from the eyes, almost more distant than the antennæ: anterior tibiæ above broadly subsulcate, superior margin of the first tibiæ distinctly dilated: formed from *Selenocephalus*.

53. DRABESCUS NERVOSOPUNCTATUS, Signoret.

Dabrescus nervosopunctatus, Signoret, A. S. E. F. (5 sér.) x, p. 209, t. 7, f. 72 (1880).

Yellow, spotted with brown: vertex very short, at least four times broader than long between the eyes, a little longer towards the eyes than in the middle; in front a blackish patch and in the middle, a black median line: ocelli as distant from the eyes as from the median line: frons black, very finely rugose, almost as long as broad at the base which is yellowish, but bounded on the margin itself of the head by a blacker line which is continued on the eyes in a lighter shade. Scrobe oblique reaching the vertex at the level of the eyes. Clypeus black, carinate, spatuliform, rugose and with two small excavations at the tip: Genæ yellow with a blackish spot beneath the antennæ which is punctured with yellow dots; almost as broad as long, with the border free, straight from the clypeus to the external angle of the eye with a weak sinuosity above the anterior coxæ and a stronger beneath the eyes. Antennæ very short, yellow, the base of the second joint and the third joint black. Pronotum nearly thrice broader than long, yellow-brown, with brown spots furnished with light yellow round dots; finely striated transversely in all its length. Scutellum brown, with irregular, long or round dots, yellow. Tegmina golden-yellow hyaline, in appearance rugose, and furnished with brown veins, almost black with white dots regularly placed, the side brown, punctured white; in addition a band at the basal third and almost the upper half, brown, lighter in the middle but forming deep spots on the side in a line with the transverse discoidal vein on the suture at the level of the tip of the clavus, in a line with the transverse veins of the apical cellules; extremity of the apical cellules and the limbus, blackish. Wings hyaline, infuscate at the tip: pectus and feet yellowish brown; base of the spines of the posterior tibiæ and the tip of the claws, blackish: abdomen yellow, with the median part of the dorsum broadly, a narrow median band on the venter, the tip of the last segment and the oviduct, black. ♀ with last segment twice as long as the preceding, weakly sinuate at the tip with a very small extension in the middle (*Sign.*). ♀, body long, 10; broad, 3½ millims.

Reported from N. India.

54. Drabescus angulatus, Signoret.

Dabrescus angulatus, Signoret, A. S. E. F. (5 sér.) x. p. 210, t. 7, f. 73 (1880).

In appearance very like *D. nervoso-punctatus*, Sign., from which it differs by the vertex being angular in the middle, frons longer, tegmina rugose although hyaline, the rugosities very close to each other, yellow, whitish at the tip and streaked with black in the hollows which they form, veins brown alternated with white dots, clavus with two transverse veinlets, one between the two veins and the other between the anal vein and the claval suture. Tegmina with a white, rugose, hyaline, basal band; a broad band, streaked black; a white hyaline band; a broad band streaked with black on the anteapical areas; further the length of the apical cellules, of a golden hyaline, yellow, glossy not rugose, the marginal border deeper infuscate with a brown spot at the tip of the fourth external apical area.

Vertex very short angularly rounded in front, a little longer in the middle than towards the eyes, concave in the latter direction, convex in the middle, the extreme edge forming a light yellow ridge bounded on the vertex by a black line, on the frons by a black band confluent with the frons itself which is black, yellowish brown at the tip and along the sides; longitudinally striated and without lateral grooves. The remainder as in *D. nervosopunctatus*, except that the ♀ has the last ventral segment strongly emarginate in the middle, sinuated on the sides, the angles angularly rounded, and at this point twice as long as the preceding segment, although in the middle it is hardly as long. Oviduct and genital plates yellow, the latter a little shorter of the two (*Sign.*). Body long, 9: broad 3 millims.

Reported from N. India.

Subfamily Jassina, Stål.

Ofvers. K. V-A. Förh. (pt.) p. 735 (1870).

Genus Jassus, Fabricius.

Syst. Rhyng. p. 85 (1803): Stål, Hem. Afric. iv. p. 119 (1866): Spångberg, Ofvers. K. V.-A. Förh. no 8 p. 3 (1878): *Cœlidia*, Germar, Burmeister.

Body oblong, subcylindrical; head a little narrower than the thorax, obtuse or very obtuse on the anterior margin: vertex horizontal, a little narrower than the eyes, gradually somewhat amplified forwards; face dilated, more or less reclined, frons occupying the greatest part of the intraocular breadth of the face, very slightly convex; clypeus produced and amplified at the apex, truncated : ocelli situate on the apical margin of the head near the eyes : thorax transverse, short, shorter than the scutellum : scutellum hardly shorter than long, subequilateral, large : tegmina margined at the apex, valvate behind the clavus, with five apical areas : feet somewhat long; posterior tibiæ very spinose (Stål).

55. JASSUS DEPLANATUS, Spångberg.

Jassus deplanatus, Spångberg, Ofvers. K. V.-A. Förh. no 8, p. 23 (1879).
? *Calidia indica*, Walker, List Hom. B. M. iii. p. 855 (1851).
? *Tettigonia jactans*, Walker, l. c. Suppt. p. 357 (1858).

Sordid yellowish white; vertex, face and feet weakly subferruginous yellowish, sides of frons weakly cinnabar : pronotum and scutellum black-fuscous, the former with sordidly flavescent-white granules; pectus and abdomen black, the former more or less spotted with flavescent, segments of the latter, posteriorly, narrowly margined with sordid yellow; tegmina sordidly flavescent white, densely spotted with fuscous; costal spot a little beyond the middle subtriangular, large, sordidly whitish hyaline and a fuscous spot placed behind the preceding, both fuscescent at the apex, veins more obscure, fuscous, sordidly spotted with white : wings fuscescent. The last segment of the abdomen in the ♀ almost twice as long as the penultimate, slightly sinuated on both sides at the apex, median lobe somewhat produced, rounded posteriorly (*Spangberg*). ♀, body long, 8; broad, 2½ : body and tegmina long, 9 millims.

Reported from E. India.

Genus THAMNOTETTIX, Zetterstedt.

Ins. Lapp. p. 292 (1840) : Stål, Hem. Afric. p. 101, 122 (1866) : Scott, E. M. M. xii. p. 21 (1875).

Body oval or very oblong : head variable in breadth and shape, obtuse or very obtuse on the anterior margin : vertex horizontal : face dilated, reclined, slightly convex; frons occupying the greatest part of the intraocular breadth of the face : ocelli placed on the anterior margin of the head at or near the eyes : thorax transverse : scutellum moderate or small, equal in length to the thorax or shorter : tegmina membranous with 4-5 apical areas, most often valvate and margined at the apex : feet moderate, posterior tibiæ, very spinose (Stål).

56. THAMNOTETTIX BIPUNCTATA, Fabricius.

Cicada 2-punctata, Fabricius, Syst. Rhyng. p. 78 (1803).
Thamnotettix bipunctata, Stål, Hom. Fabr. ii. p. 82 (1869).

Yellowish green, shining, smooth : frons (except the lateral margins) entire lores or beneath the middle, a spot before the middle and the apical two-fifths of corium and lateral spots on the pectus and abdomen, black, the incisures of the abdomen greenish-yellow: wings infuscate. ♂, body long $4\frac{2}{3}$; broad, $1\frac{1}{6}$ millims.

Reported from Tranquebar. Head scarcely as broad as the thorax and a little shorter very obtusely roundly subangulate: vertex about twice as broad as the eyes, hardly twice as broad as long, slightly impressed within the anterior margin ; face very slightly convex : thorax hardly more than two and half times broader than long, obtusely rounded anteriorly : tegmina rounded at the apex, valvate behind the clavus (Stål).

Genus Hylica, Stål.

Stål, Trans. Ent. Soc. Lond. (3 sér.) i. p. 593 (1863).

Body oblong-obovate : head acutely produced, face somewhat reclined : ocelli placed on the upper part of the head, near the anterior angles of the eyes : rostrum very short : thorax somewhat elevated backwards, tuberculated, anterior lateral margins long, anterior middle angularly produced : scutellum elevated, tuberculated : tegmina subcoriaceous, broadly membranously margined at the apex : abdomen broader than the tegmina, posterior segments acutely lobed and reflexed on both sides : feet somewhat short, anterior tibiæ above somewhat dilated, posterior above spinose. Close to *Tettigonia* (Stål).

57. Hylica paradoxa, Stål.

Hylica paradoxa, Stål, Trans. Ent. Soc. Lon. (3 ser.) i. p. 593 (1863).

Body oblong-obovate, blackish or fuscous-testaceous ; face below the middle (a black spot excepted), disc or two broad stripes on the venter sordidly stramineous. Var. *a*, feet sordidly stramineous, annulated with fuscous. Var. *b*, feet fuscous-testaceous ; femora palely banded. ♀, body long, 10 : broad, $3\frac{1}{2}$ millims.

Frons produced at the base in a short, compressed, slightly curved horn and furnished in the middle with two small tubercles: two posterior, distant tubercles on the thorax, higher than the rest, compressed : scutellum much elevated before the middle, furnished near the apex with a conical tubercle ; disc of the elevated part hollowed out and more compressly-elevated on both sides (Stål).

Reported from Burma.

Genus Penthimia, Germar.

Mag. Ent. iv. p. 46 (1821). Stål, Hem. Afric. iv. p. 100. 107 (1866) : Fieber. Rev. Mag. Zool. (3 sér.) ii. p. 392 (1875).

Body oval or ovate, somewhat depressed: head obtuse, anteriorly rounded; vertex somewhat sloped, slightly convex before the middle; lateral margins of face, somewhat distinct; frons a little convex; clypeus flat or very slightly convex: eyes moderate: ocelli placed on the disc of the vertex, more distant from each other than from the eyes: thorax transverse, a little narrowed forwards, anterior margin round: tegmina margined at the apex, valvate behind the clavus, 4-5 apical areas: feet moderate; femora compressed; last tibiæ very spinose (Stål).

58. PENTHIMIA ORIENTALIS, Walker.

Penthimia orientalis, Walker, List Hom. B. M. iii. p. 841 (1851).

Deep black, oval: head and chest convex, thinly punctured: posterior border of pectus, red: tegmina thickly punctured; tips of tegmina and wings brown. Body long, 7: teg. 14½ millims. A variety has the abdomen red on each side towards the tip: anterior tibiæ and feet mostly red (*Walker*).

Reported from N. India.

59. PENTHIMIA COMPACTA, Walker.

Penthimia compacta, Walker, List Hom. B. M. iii. p. 842 (1851).

Ferruginous, short, broad: head and anterior margin of thorax, black: head very short, nearly as broad as the thorax, slightly concave posteriorly, rather more convex in front; face convex, distinctly transversely sulcated; thorax convex, minutely punctured black towards the fore border: tegmina piceous, ferruginous along the posterior margin: wings almost colourless (*Walker*). Body long, 3: wings long, 6¼ millims.

Reported from N. India.

60. PENTHIMIA CASTANEA, Walker.

Penthimia castanea, Walker, J. L. S. Zool. i. p. 98 (1856).

Ferruginous, smooth, shining: head black in front and beneath: pectus black in front and with a black spot on each side behind: legs black; tibiæ very spinose: tegmina lurid and with black spots towards the tips (*Walker*). Body long, 5; teg. 10½ millims.

Reported from Malacca, Tenasserim.

ADDITIONS AND CORRECTIONS.

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61. MONECPHORA TRIMACULA, Walker.

Monecphora trimacula, Walker, List Hom. B. M. iii. p. 682 (1851).

Body long, 7¼: exp. teg. 18¾ millims: reported from India.

62. SPHENORHINA CONTIGUA, Walker.

Sphenorhina contigua, Walker, l. c. p. 695 (1851).

Body long, 8½; teg. 18¾ millims: reported from N. India.

63. SPHENORHINA INTERMEDIA, Walker.

Sphenorhina intermedia, Walker, List l. c. p. 695 (1851).

Body long, 7¼: teg. 16¾ millims: reported from N. India.

64. SPHENORHINA PROXIMA, Walker.

Sphenorhina proxima, Walker, List l. c. p. 695 (1851).

Body long, 7¼: teg. 14½ millims: reported from N. India.

65. SPHENORHINA BRACONOIDES, Walker.

Sphenorhina braconoides, Walker, l. c. Suppt. p. 185 (1858).

Body long, 6½: teg. 16¾ millims: reported from Burma.

66. SPHENORHINA APPROXIMANS, Walker.

Sphenorhina approximans, Walker, l. c. Suppt. p. 185 (1858).

Body long, 6½-8½; teg. 16¾-19 millims: reported from N. India.

67. POOPHILUS COSTALIS, Walker.

Ptyelus costalis, Walker, List Hom. B. M. iii. p. 707 (1851): Stål, Ofvers. K. V.-A. Förh. p. 493 (1862).

Ptyelus concolor, Walker, List l. c. p. 715 (1851).

Ptyelus dolosus, Walker, List l. c. Suppt. p. 189 (1858).

Ptyelus rotundatus, Signoret, in Thoms. Arch. Ent. ii. p. 332 (1858).

Ptyelus natalensis, Stål, Ofvers. K. V.-A. Förh. p. 97 (1858).

Poophilus natalensis, Stål, Hem. Afric. iv. p. 74 (1866).

More or less weakly or obscurely ivory-grey, pubescent; tegmina varied with fuscous; frontal part of anterior margin of the head, pallid, with five black spots: wings colourless, slightly infuscate at the apex: ventral disc black: tegmina nearly thrice longer than broad, apical half narrowed: frons and anterior feet, fuscous; apex of femora pallid (*P. natalensis*, Stål). ♀, long 9-10; broad, 3-3½ millims.

Reported from S. and W. Africa, Ceylon, N. India. Stål notes that his Ceylon example differs from the S. African in the head being a little more obtuse and more rounded.

68. CLOVIA CONIFER, Walker.

Ptyelus conifer, Walker, List Hom. B. M. iii. p. 711 (1851); J. A. S. B. liv. (2), p. 19 no. 38 (1885).

Ptyelus simulans, Walker List l. c. p. 717 (1851).

Ptyelus frenulatus, Stål, Ofvers. K. V.-A. Förh. p. 250 (1854): l. c. p. 493 (1862).

Head and thorax ferruginous, flat, very thickly and minutely punctured, covered with tawny down: head short, indistinctly striped with brown, sinuate along the hind border, more rounded in front, its length not more than one-fourth of its breadth; face piceous, roughly punctured, with ten slight oblique ridges on each side of the disc which is flat; two yellow stripes along the sides unite near the front and form a cone and are produced along the pectus: the clypeus shining, convex, ferruginous, with an oblique furrow on each side; rostrum ferruginous, tip piceous; pectus with a broad black band between the anterior and intermediate legs: abdomen ferruginous, testaceous at the base: legs testaceous: tegmina ferruginous, conical towards the tips which are almost pointed, nearly colourless for half the breadth beneath the fore-border from the middle to the tips; some forked brown streaks in the disc, a few of them communicating with an irregular curved brown stripe which extends from three-fifths of the length of the fore-border to the tip and is darkest at each end: wings colourless; veins black, tawny at the base (*Walker*). Body long, 6¼; teg. 16½ millims.

Reported from India, Java.

69. CLOVIA PUNCTUM, Walker.

Ptyelus punctum, Walker, List Hom. B. M. iii. p. 718 (1851); Stål. Ofvers. K. V.-A. Förh. p. 493 (1862): J. A. S. B. liv. (2), p. 19 (1885).

Ptyelus bipunctipennis, Stål, l. c. p. 250 (1854): Java.

Pale tawny, covered with pale down: head and thorax almost flat: head very convex in front, with two furrows which diverge from the fore border and communicate with two more oblique impressions near the hind border; face very convex, with a blackish disc, which has about eight oblique ridges on each side; disc of the breast, blackish: tegmina with a dark brown dot on the hind border near the tip; wings colourless; veins pale stramineous (*Walker*). Body long, 5: teg. 11½ millims.

Reported from N. Bengal, Java.

70. PTYELUS SEXVITTATUS, Walker.

Ptyelus sexvittatus, Walker, List Hom. B. M. iii. p. 715 (1851); J. A. S. B. liv. (2), p. 19 (1885).

Yellow, shining: head and chest flat, minutely punctured, adorned with six black stripes: head concave along the hind border, almost conical in front; its length less than half its breadth; face very convex with indistinct ridges on each side, black towards the clypeus which is also black: disc of the pectus mostly black: abdomen piceous: a short dorsal stripe, hind borders of the segments, and oviduct, tawny: legs yellow; tips of the hind tibiæ and of the hind feet, piceous: tegmina brown, narrow, with two very large white spots on the fore border, with two indistinct whitish marks near the base, and with two more along the hind border: wings colourless; veins tawny, pale yellow towards the base (*Walker*). Body long, 5; teg. 12½ millims.

Reported from N. India.

71. PTYELUS SUBFASCIATUS, Walker.

Ptyelus subfasciatus, Walker, List Hom. B. M. iii. p. 724 (1851); J. A. S. Ben. liv. (2), p. 19 (1885).

Pale tawny, shining, very finely punctured: head above luteous, slightly concave along the hind border, very convex in front; face very convex, piceous towards the clypeus which is also piceous; ridges on each side very slight: thorax with six brown stripes; a brown spot on each side by the base of the tegmina: disc of the pectus, black: abdomen piceous, pale tawny at the base: tips of the hind tibiæ, black: tegmina brown with a tawny spot on each side at the base and with two white bands, the first not reaching the hind border, the second interrupted in the middle: wings colourless, veins tawny (*Walker*). Body long, 3½: teg. 8½ millims.

Reported from N. India.

72. UROPHORA HARDWICKII, Gray.

Urophora hardwickii, Gray, Griffith's ed. Animal kingdom, Ins. ii. p. 261, t. 90, f. 3; t. 138, f. 5 *a-d*. (1832): Walker, List Hom. B. M. iii. p. 645 (1851).

The characters of the genus and species are given thus by Gray:—"the thorax produced over the head; the posterior legs simple and with the ovipositor forming a long tube; fulvous with the tegmina spotted between the veins with brown; the legs and ovipositor obscure": near *Æthalion*, Latr. Body long, 18; ovipositor long, 13 millims.

Reported from Nepal: the Indian Museum possesses specimens from Sikkim, Assam.

Journal, liii. (2) No. 3 for 1884, p. 219 No. 26, *H. transversa*, Walker is the same as *Gœana dives*, West l. c. p. 221, No. 34.

l. c. p. 224, *D. lateralis*, Walker, No. 41 is the same as *D. vibrans*, Walker, No. 43.

l. c. p. 225, *D. immacula*, Walker, No. 52 is the same as *D. mannifera*, Linn, No. 39.

l. c. p. 229, omit *C. subtincta*, Walker, No. 70: Walker's locality is incorrect.

l. c. p. 229. *C. anœa*, Walker, No. 71 is included in *C. striata*, Walker, List i. p. 206.

l. c. p. 230. *Cicada subvitta*, Walker, No. 73 is a Tibicen.

l. c. p. 230. *Cicada xantes*, Walker, No. 75 is a Cicadatra.

l. c. p. 231, *Fidicina operculata*, No. 81 is the same as *Fidicina Bubo*, Walker, List, p. 82 and is a Cryptotympana.

l. c. p. 231. *Fidicina corvus*, Walker, No. 82 is a Cryptotympana.

l. c. p. 232. *T. apicalis*, Germar, No. 14 includes also *Cicada semicincta*, Walker, List, i. p. 142.

l. c. p. 232. *M. illustrata*, Am. & Serv. No. 85 and *M. recta*, Walker, No. 86 are the same as *M. conica*, Germar.

l. c. 233. *M. quadrimacula*, Walker, No. 93 is a Cicadatra.

l. c. p. 233. *M. terpsichore*, Walker, No. 94 is a Dundubia.

Journal liv. (2) No. 1 for 1885, p. 19. *P. quadridens*, Walker, No. 39 includes as a variety *Clovia guttifer*, Walker, l. c. p. 20, No. 44 and is a Clovia.

X.—*Descriptions of some new Indian* Rhopalocera.

By Lionel de Nicéville.

[Received, Feby. 7th,—Read, March 4th, 1885.]

(With Plate II.)

Symbrenthia silana, n. sp., Pl. II, Fig. 9, ♂.

♂. Upperside black, *forewing* with a very regular streak from the base to beyond the cell extending slightly below the median but not touching the subcostal nervure, a subapical irregular streak not quite reaching to the costa or the outer margin, beyond which is a curved narrow lunular line; a broad band placed obliquely from the second median nervule to the inner margin. *Hindwing* with a broad discal band, a submarginal one less than half the width of the discal band becoming attenuated anteriorly, an obsolete (hardly traceable) very fine marginal line; all these markings bright ochreous paler in the middle. Underside with the markings as above but glossy opaline white, the black ground-colour replaced by prominent black and yellow tesselations. *Hindwing* with a discal series of five imperfect somewhat cone-shaped ocelli of moderate size, the three nearest the anal angle centred with brilliant metallic blue; three lunules of that colour at the anal angle. *Both wings* with the margin black, a submarginal fine line defined with yellow on both sides.

♀. Larger, the *forewing* broader, the outer margin evenly curved. Markings throughout paler, except the blue ones on the underside of the hindwing, which are larger and more prominent. The subapical streak on the upperside of the forewing touching the costa, and a small narrow spot just within it.

Expanse ♂ 2·1, ♀ 2·3.

HAB. Buxa, Bhutan *(Moti Ram)*, Sikkim *(Otto Möller)*.

Near to *S. niphanda*, Moore, which also occurs in Sikkim, but may be at once distinguished from that species by the ochreous bands on the upperside being much wider, and on the underside much paler also. The five cone-shaped imperfect ocelli are less than half the size of those of *S. niphanda*, and the centres of three of them and the anal lunules are pure cerulean blue instead of green.

NACADUBA HAMPSONII, n. sp., Pl. II, Fig. 13, ♂.

♂. UPPERSIDE deep violet-purple, the outer margins of both wings narrowly black. UNDERSIDE pale brown, tinged with ochreous on the inner margin extending into the disc of the forewing, which wing bears the following blackish markings outwardly defined with white:—a quadrate spot across the middle of the cell with a small spot above it on the costa, a similar but larger one closing the cell, a discal curved chain of six spots (which is shifted inwards at the penultimate spot from the inner margin), and a submarginal series of lunules. *Hindwing* marked with some indistinct spots at the base, then four subbasal ones extending across the wing, one closing the cell, and a much curved and irregular discal series. Submarginal lunules as in forewing but bearing three black spots towards the anal angle, the outermost one large and prominent, the others small. No tail. The usual anteciliary black line; cilia pale brown, on the hindwing marked with dark brown at the ends of the nervules.

Expanse 1·15 inches.

HAB. Ootacamund, Nilgiri Hills, South India. In coll. G. F. Hampson and L. de Nicéville.

Nearest to the tailless *N. dana*, de N., which also occurs at Ootacamund, but differing on the upperside in being of a different colour (deep violet-purple instead of light bluish-purple), and on the underside in having the markings throughout darker and more conspicuous, and the ground-colour also darker. The forewing is also narrower and more produced at the apex.

CATAPÆCILMA BUBASES, Hewitson, Pl. II, Figs. 11, ♂ & 1, ♀.

Hypochrysops bubases, Hewitson, Ent. Month. Mag., vol. xii, p. 38 (1875).

♂. UPPERSIDE smoky purplish-black, obscurely shot with purple in some lights, the cilia blackish marked with white towards the anal angle of the forewing and throughout the hindwing. Two very fine silvery lines on the margin at the anal angle. Tails black tipped with white. UNDERSIDE black, densely and evenly striated with chrome-yellow, and with scattered greenish-silvery metallic spots and streaks, which form a marginal series on both wings.

♀. UPPERSIDE, *forewing* pale blue, with the costa, the apex widely, and the outer margin blackish. *Hindwing* with all but the outer margin, which is blackish, pale blue. Towards the anal angle there is first a fine pale blue line, then a yellow one defined on both sides by a black one, and then another pale blue line. UNDERSIDE as in the male.

Expanse ♂ ♀ 1·25 inches.

HAB. Sikkim *(Otto Möller)*, Malacca *(Hewitson)*.

This is only the second known species of the genus recorded from India; the first (*C. elegans*, Druce) has a very wide range, occurring in Borneo (whence it was described), the Malay peninsula, Cachar *(Wood-Mason)*, Ceylon, Cannanore, S. India *(Major-General Macleod)* ; Orissa *(W. C. Taylor)*, and Sikkim *(Otto Möller)*.

Hewitson's description of *C. bubases* is very meagre; a comparison of his Malaccan female type with Sikkim specimens may disclose specific differences.

SATADRA SINGLA, n. sp., Pl. II, Figs. 6, ♂ & 7, ♀.

♂. UPPERSIDE very dark shining purple, with a somewhat broad black margin. *Forewing* with a distinct black discocellular mark. UNDERSIDE, *forewing* brown, paler towards the inner margin, widely washed at the apex with pale violet, and bearing the following dark brown spots with pale margins :—a circular one towards the base of the cell, a large oval one just beyond its middle, and a quadrate one closing it, above the last a small spot on the costa, one filling the base of the interspace between the first and second median nervules, and a large one below and within the latter reaching the submedian nervure; a discal chain of seven spots, broken and inclined inwards at the fifth spot, a submarginal lunular band not reaching the apex, the margin dark brown. *Hindwing* pale brown, all but the bands and spots powdered with pale violet-whitish, giving it an unusual and peculiar appearance. The spots and bands arranged as in other species of this group, somewhat indistinct. The anal lobe rufous-brown (not black as in many species); in one specimen a few metallic-green scales above and beyond it. Tail of moderate length, pale brown, tipped with white.

♀. UPPERSIDE, *forewing* with a large patch of bluish-violet in the middle; *hindwing* with some traces of this colour in the cell and just below it. UNDERSIDE with the ground-colour and markings paler throughout than in the male.

Expanse ♂ 1·8, ♀ 1·8 to 2·0 inches.

HAB. Sikkim.

Near to *Satadra bupola*, Hewitson, many specimens of both sexes of which species, also from Sikkim, are now before me. *S. singla* ♂ may be distinguished at once from that species by the much narrower and more produced forewing, by the colour of the upperside being of a much darker shade of purple, and both sexes by the violet-whitish powdering of the hindwing on the underside. Allied also to *S. silhetensis*, Hewitson, a female specimen of which from the typical locality is in the Indian Museum, Calcutta. On the upperside of the latter the violet-blue colour is far more extensive and lighter in shade, the underside is also uniform bright brown throughout, not powdered with violet-white as in *S. singla*.

PLASTINGIA NOËMI, n. sp., Pl. II, Fig. 15, ♂.

♂. UPPERSIDE black. *Forewing* with a fusiform chrome-yellow streak on the costa from the base to nearly half the length of the wing, a similarly-coloured streak placed below the median nervure and divided by the submedian into two unequal parts, the lower portion the smaller, extending to rather more than half the inner margin of the wing from the base; and with two or three subapical conjoined increasing spots, two lengthened spots at the end of the cell placed one above the other, the upper one the smaller, a triangular spot towards the base of the second median interspace, a much larger one towards the base of the first, all semi-transparent yellowish-white. *Hindwing* with a chrome-yellow patch placed in the middle of the disc just beyond the cell, and divided by the black nervules. UNDERSIDE, *forewing* black, the costa narrowly, the apex very widely, and a patch placed in the middle of the submedian interspace chrome-yellow. The semi-transparent spots as above. Five rounded small black spots placed in an outwardly-angled subapical series. *Hindwing* chrome-yellow; the margin increasingly to the anal angle, then decreasingly up the abdominal margin black. A subbasal spot, another at the end of the cell, a series of eight spots placed round the cell, all black. *Antennæ* black, the club yellow. *Thorax* and base of *abdomen* above clothed with long greenish-ochreous hairs, the rest of the abdomen black ringed with yellow, the thorax and *legs* beneath chrome-yellow.

Expanse 1·6 inches.

HAB. Sikkim *(Otto Möller* and *Dr. T. C. Jerdon)*. In coll. Colonel A. M. Lang, collected by Dr. T. C. Jerdon.

Belongs to the same group as the *Hesperia callineura* of Felder (? = *Hesperia latoia*, Hewitson), but is quite distinct.

HALPE SITALA, n. sp., Pl. II, Fig. 5, ♂.

♂. UPPERSIDE, *forewing* dark brown; two minute conjoined subapical dots, two well-separated spots placed obliquely near the end of the cell, and two similar ones on the disc, semi-diaphanous ochreous-white. The usual sexual mark, somewhat indistinct. *Cilia* ochreous, dusky at the ends of the nervules. *Hindwing* dark brown, with a patch of ochreous hairs in the middle of the wing; *cilia* ochreous. UNDERSIDE, *forewing* dark brown, the costa and apex widely ferruginous-ochreous; the spots as above. *Hindwing* ferruginous-ochreous; two conspicuous white dots placed in the median interspaces, two indistinct ochreous spots placed close together between the innermost of the two spots and the anal angle. *Antennæ* dusky above, the club and upper portion of the shaft below ferruginous.

Expanse 1·5 inches.

HAB. Ootacamund, S. India (*G. F. Hampson*).

HALPE KUMARA, n. sp., Pl. II, Fig. 10, ♂.

♂. UPPERSIDE deep bronzey-brown. *Forewing* with five small equal-sized ochreous spots, *viz.*, two conjoined subapical, one at the upper and outer angle of the cell, and two on the disc. *Hindwing* unmarked. UNDERSIDE with the costa and apex diminishing towards the inner angle of the forewing and the entire hindwing clothed with deep ochreous scales; the spots of the forewing as above but larger. An anteciliary black line; *cilia* ochreous, dusky at the end of the nervules in the forewing. *Antennæ* dusky above, the club and upper portion of the shaft bright ochreous. The sexual mark on the upperside of the forewing indistinct.

Expanse 1·4 inches.

HAB. Sikkim (*Otto Möller*).

Allied to *Halpe separata*, Moore, a female specimen of which from Sikkim is before me. Differs from that species in having only two subapical spots, the spot in the cell not transverse, and the posterior border of the forewing on the underside dark brown, not yellow.

ISOTEINON PANDITA, n. sp., Pl. II, Fig. 14, ♂.

♂. UPPERSIDE brown, sparsely clothed with ochreous scales. *Forewing* with a quadrate transverse spot at the end of the cell, three conjoined subapical ones, and two similar discal ones, semi-diaphanous ochreous. *Cilia* ochreous. *Hindwing* immaculate. UNDERSIDE brown, forewing with the apex widely and the costa and the entire hindwing ferruginous-ochreous. *Forewing* with the spots as above. *Hindwing* with a very indistinct small black spot at the end of the cell, and a discal series of similar short streaks between the nervules. *Cilia* ochreous. *Antennæ* black, the tip of the club, and the upper portion of the shaft below the club ferruginous.

Expanse 1·2 inches.

HAB. Sikkim *(Otto Möller)*.

ISOTEINON FLAVIPENNIS, n. sp., Pl. II, Fig. 4, ♀.

♂ and ♀. UPPERSIDE brown, glossed with purple on the outer area of the forewing, the *hindwing* bearing a patch of long ochreous hairs in the middle of the disc and on the abdominal margin. *Forewing* with the following white semi-transparent spots:—a small round one in the middle of the upper discoidal interspace; two at the end of the cell, one above the other, the lower twice the size of the upper; a large spot in the interspace below and a small one placed in the second median interspace near its base. UNDERSIDE with the costa and apex widely and the entire hindwing ferruginous-ochreous glossed and marbled with purple, the disc of the forewing dark brown, the inner margin paler. *Forewing* with the spots as above; *hindwing* with a dark-brown spot in the cell and a series of five or six similar spots placed around the cell. *Cilia* cinereous, dark brown at the end of the nervules. *Antennæ* black, annulated with pale ochreous beneath, the club, all except the extreme tip, pale ochreous beneath.

Expanse 1·3 to 1·4 inches.

HAB. Buxa, Bhutan *(Moti Ram)*, Sikkim *(Otto Möller)*, and South Andaman Island *(A. de Roepstorff)*.

THANAOS JHORA, n. sp., Pl. II, Fig. 12, ♂.

♂. UPPERSIDE dark brown; *cilia* whitish marked with brown at the ends of the nervules. *Forewing* with a discal curved series of about six pale dots. *Hindwing* unmarked. UNDERSIDE dark brown, the costa and the apex of the forewing and the entire hindwing greenish-ochreous. *Forewing* with the discal series of spots as above, and an indistinct marginal lunular series. *Hindwing* with a very irregular discal series of spots and an obscure marginal series.

Expanse ·95 to 1·05 inches.

HAB. Sikkim *(Otto Möller* and *de Nicéville)*.

Nearest to *T. stigmata*, Moore (Pl. II, Fig. 2, ♂, from Masuri), which occurs commonly in Sikkim with it, and is the only species of the genus hitherto described which is furnished with a male sexual mark on the upperside of the forewing.

THANAOS KALI, n. sp., Pl. II, Fig. 3, ♂.

♂. UPPERSIDE deep purplish-black, the *cilia* cinereous. UNDERSIDE slightly paler. *Forewing* with a discal outwardly-angled series of eight pale violet-white dots, an even somewhat larger marginal lunular series. *Hindwing* with a discal irregular series of pale violet-white spots, within which are some obscure pale markings; a marginal series as in the forewing. *Cilia* cinereous, marked with dark brown at the ends of the nervules.

Expanse 1·15 inches.

HAB. Sikkim *(Otto Möller* and *de Nicéville)*.

This is a very distinct species.

PLESIONEURA NIGRICANS, n. sp., Pl. II, Fig. 6, ♀.

♂ and ♀. UPPERSIDE swarthy, slightly sprinkled with ochreous scales on the basal half of the forewing. *Forewing* with an oblique semi-diaphanous pure white band across the disc composed of three conjoined spots, the middle one at the base of the interspace between the first and second median nervules the smallest, elongated, and projecting beyond the outer margin of the other two spots; a small similar spot placed below the lower outer angle of the third spot, and an opaque spot placed above the uppermost spot not quite reaching the costa; and with a recurved series of from three to five dots before the apex. *Hindwing* with the basal and abdominal areas sparsely clothed with long ochreous hairs. UNDERSIDE, *forewing* as above, but the lowest spot of the discal band much larger, its inner margin straight, its outer margin blurred. *Hindwing* with an indistinct ochreous spot at the end of cell, and submarginal series of similar spots, the two towards the anal angle rather more distinct than the others. The base and abdominal area somewhat ochreous. *Cilia* dusky on the forewing excepting a small portion towards the inner angle which is ochreous; dusky also on the hindwing, with three ochreous spots below the outer angle, and one towards the anal angle. *Antennæ* blackish, the underside of the club and a small portion of adjoining shaft pure white.

Expanse 1·7 inches.

HAB. Sikkim *(Otto Möller)*, Buxa, Bhutan *(Moti Ram)*.

EXPLANATION OF PLATE II.

Fig. 1 *Catapœcilma bubases*, Hewitson, ♀.
„ 2 *Thanaos stigmata*, Moore, ♂.
„ 3 „ *kali*, ♂, n. sp.
„ 4 *Isoteinon flavipennis*, ♀, n. sp.
„ 5 *Halpe sitala*, ♂, n. sp.

Fig. 6 *Plesioneura nigricans*, ♀, n. sp.
„ 7 *Satadra singla*, ♀, n. sp.
„ 8 „ „ ♂, n. sp.
„ 9 *Symbrenthia silana*, ♂, n. sp.
„ 10 *Halpe kumara*, ♂, n. sp.
„ 11 *Catapœcilma bubases*, Hewitson, ♂
„ 12 *Thanaos jhora*, ♂, n. sp.
„ 13 *Nacaduba hampsonii*, ♂, n. sp.
„ 14 *Isoteinon pandita*, ♂, n. sp.
„ 15 *Plastingia noëmi*, ♂, n. sp.

XI.—"*The Swatch of no Ground*".—*By Commander* ALFRED CARPENTER, R. N., *in charge of Marine Survey of India. Communicated by the* NATURAL HISTORY SECRETARY.

[Received June 6th;—Read July 1st, 1885.]

The Bay of Bengal, the entrance to which between Ceylon and the Nicobar Islands has a depth of some 2000 fathoms, gradually shoals northward to the 19th parallel of latitude, where it has a depth of about 1400 fathoms. In the next 60 miles northward, the head of the Bay shoals rapidly, as might be expected when it is entered by such rivers as the Ganges and the Brahmaputra.

The particles of mud discharged by a river debouching through a flat delta are very minute and are held in suspension for days. It is these which slowly settling form here a bank of olive-coloured mud and grey sand. If we now look at a chart of the Bay of Bengal and examine the mouths of this great delta and the shoals formed off them, we shall notice with surprise that the direction of every channel through these shoals is such as to tend to throw the ebbing waters towards the region called the Swatch. This is especially noticeable in Chart 829 Coconada to Bassien river.

Presuming then that this tendency is actually followed by the ebbing water, the result is a number of whirls and eddies just in that locality, the position of the Swatch being central with regard to the deltaic mouths.

The condition necessary to admit of mud in suspension settling to the bottom is perfect quiescence of the supporting medium. This never occurs here during the ebb tides. During the flood, which only lasts 5 hours against 7 hours' ebb, the water is only muddy for the first hour, while the outflow partly returns; the green ocean water then comes in carrying little or nothing in suspension. In this region, then, we have only one hour's settle of mud against 6 hours or 7 hours over the adjoining banks. During the course of ages the banks on either side have grown seaward [illegible] their southern face falls abruptly into deep water. But in the Swatch the banks have never been able to meet and the depth still remains considerable.

This submarine ravine is 1800 feet deep at 15 miles from the flat mangrove islands of the delta, whilst at that distance off shore the bank on each side of the Swatch is only 100 feet below water.

The 'Investigator' in the Spring of this year, 1885, re-sounded the whole bank of soundings from False Point to the Mutla river entrance. Compared with the surveys of some forty years ago there has been remarkably little change, but close off the Rivers Hughly and Mutla the banks have extended southward over a mile.

When the 'Investigator' trawled in the Swatch last March the bottom mud was found to be exceedingly soft, and consisted of a dark green ooze largely mixed with shells of pteropods. Life here was comparatively scarce, only some annelid worms in muddy tubes and some bivalve shells being found in the deeper portions, though at the sides, on the sloping banks, several fish, *Macrurus* and small sharks, and some shrimps and several other species of Crustacea were found. The mouth of the Swatch rises somewhat rapidly from about 900 to 600 fathoms with a bottom temperature of 43°7 Fahrenheit. This is a little above the average of open seas at corresponding depths, but, considering that it is in Lat 20° N. and that the water has presumably come from the Antarctic Ocean, the difference is intelligible. The depth of 600 soon decreases to 450 fathoms, at which depth a channel runs nearly up to the head of the Swatch and carries the cold water northward, for at 100 fathoms at the head the temperature was as low as 56° though the surface at the same time shewed 81°.

The temperature at the bottom between the Andamans and Ceylon in 2100 fathoms is only 33.°7 Fahrt. corrected, this being in Lat. 8° N. There is probably a deep valley trending up the west centre of the Bay of Bengal, and the 'Investigator' will annually add to our information of its configuration. The position of the Swatch would be about in the continuation of this valley, which is the main line of depression between India and Burma, its northern extension being now filled with deltaic deposits. Although the actual ground of the Swatch is of these same deposits, and so of comparatively recent formation, the feature is in a great measure due to the conflict of the same terrestrial waters, to the erosive action of which in bygone times the rock-valley itself must be in part attributed.

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XII.—*Notes on Indian* Rhynchota, No. 4.—*By* E. T. Atkinson, B. A.

[Received July 7th;—Read August 5th, 1885.]

Family Fulgoridæ, Leach.

Edin. Ency. ix (1817); Westwood, Mod. Class. Ins. ii, p. 427 (1840); Fieber, Verh. Zool.-Bot. Gess. Wien, xvi, p. 497 (1866):—*Fulgorellæ*, Latr. Gen. iii, p. 163 (1807); Spinola, A. S. E. F. (1 sér.) viii, p 133, 202 (1839):—*Fulgorina*, Burm., Handb. Ent. ii (i) p. 102, 144 (1835):—*Fulgorida*, Stål, Hem. Afric. iv, p. 128 (1866).

Two ocelli, rarely three or none, one on each gena; third, when present, placed on the apex of the frons: genæ reflexed, very often separated from the frons by a ridge: tegmina at the base with a tegula, which is seldom wanting, hidden: anterior coxæ inserted near the sides of the body, very often elongate; last pair, transverse, contiguous, extended to the lateral margins of the body (*Stål*).

Subfamily Fulgorina, Stål.

Fulgorides, Am. & Serv., Hist. Nat. Ins. Hém. p. 488 (1843). *Fulgorida*, Stål, Hem. Afric. iv, p. 129 (1866), Stettin Ent. Zeit. xxxi, p. 255, 282 (1870); *Fulgorina*, Stål, Ofvers. K. V.-A., Förh. p. 740 (1870).

Anal area of wings reticulated; the ridge separating the frons from the genæ is continued in the sides of the clypeus (*Stål*).

Genus Fulgora, Linnæus, Stål.

Fulgora, Stål, Hem. Afric. iv, p. 133 (1866); *Hotinus*, Am. & Serv., Hist. Nat. Ins. Hém. p. 490 (1843): Walker, List Hom. B. M. ii, p. 264 (1851).

Vertex much broader than the eyes: head furnished with a long process, rounded or subtetragonal: genæ truncated before the eyes: frons slightly sinuated at the apex, furnished with 2—3 longitudinal ridges: feet slender: scutellum slightly carinated; cephalic process more or less curved (*Stål*).

A. *Section with (when dead) orange wings.*

1. FULGORA CANDELARIA, Linnæus.

Cicada candelaria, Linn., Acta Holm. p. 63, t. 1, f. 5, 6 (1746): Rœsel von Rosenhof, Ins. Belust. 2, Gryll. p. 189, t. 30 (1749); Sulzer, Ins. t. 10, f. 62 (1761).

Laternaria candelaria, Linn. Mus. Lud. Ulr. p. 153 (1764).

Fulgora candelaria, Linn. Syst. Nat. i (2) p. 70 (1766); De Géer, *Cigale chinoise porte-lanterne*, Ins. iii, p. 197 (1773); Fabricius, Syst. Ent., p. 673 (1775); Spec. Ins. ii, p. 313 (1781); Gmelin, ed. Syst. Nat. i (4) p. 2089 (1782); Fabr. Mant. Ins. ii, p. 260 (1787); Ent. Syst. iv, p. 2 (1798); Syst. Rhyng, p. 2 (1803); Olivier, Enc. Méth. vi, pp. 568, 593, t. 109, f. 3 (1790): Stoll, Cigales, *(Cigale Chinoise)*, p. 44, t. 10, f. 46 A. (1788): Burmeister, Handb. Ent. ii (i) p. 168 (1835): Westwood in Donovan's Insects China, t. 14, (1842); Trans. Linn. Soc. XVIII, p. 138 (1841): Blanchard, Hist. Nat. Ins. Hém. t. 12, f. 1 (1840-41); Butler, P. Z. S. p. 97 (1874).

Flata candelaria, Germar, Mag. iii, p. 189 (1818).

Pyrops candelaria, Spinola, A. S. E. F., viii, p. 238 (1839).

Hotinus candelarius, Am. & Serv., Hist. Nat. Ins. Hém. p. 490 (1843); Walker, List. Hom. B. M. ii, p. 265 (1851).

Head produced in a horn, as long as the body, subulate, ascending, obtuse, somewhat compressed, subangulate, red, sprinkled with milk-white spots: eyes subglobose, a globose pellucid dot beneath the eyes: antennæ beneath the eye, very short, two-jointed, lower joint cylindrical, upper subglobose, fuscous, ending in a very small seta: thorax testaceous, like the three-cornered scutellum; abdomen, above fulvous, beneath black, with luteous margins: tegmina fuscous, reticulated green and adorned with various luteous spots margined with whitish of which the first band is transverse and the second cruciform, the rest round: wings luteous, broadly black towards the apex: feet flavescent, first and second tibiæ black, third denticulate (*Linn.* M. L. U.). Long 40—45; cephalic process 15—20 millims.

Reported from China, Cambodia, India. The Indian Museum possesses specimens from Sikkim, Assam. The next three appear to be little more than local varieties of *F. candelaria*.

2. FULGORA BREVIROSTRIS, Butler.

Fulgora brevirostris, Butler, Proc. Zool. Soc. p. 97, 1 t. xv, f. 1, (1874).

Closely allied to *F. candelaria*; tegmina black, with the veins and spots bright ochraceous, disposed as in *F. candelaria*; wings orange-ochreous, the apical third black; cephalic process short, curved, ascending, testaceous with paler spots: prothorax much compressed in front, with a central longitudinal ridge and two strongly impressed black punctures, testaceous, with a black lateral patch; the rest of the body, luteous above, mesothorax maculated with black; abdomen below black, the margins of the segments testaceous; legs pitchy; the coxæ and the femora of the last pair, dirty testaceous (*Butler*). Body long with cephalic process 29—30; cephalic process 13 and exp. teg. 63 millims.

Reported from India, Penang: the Indian Museum possesses a specimen from Sikkim (?).

3. Fulgora viridirostris, Westwood.

Fulgora (Hotina) viridirostris, Westwood, Cab. Or. Ent. p. 8, t. 3, f. 4, (1848).
Hotinus viridirostris, Walker, Cat. Hom. B. M. ii, p. 265 (1851).
Fulgora viridirostris, Butler, P. Z. S. p. 98 (1874).

Cephalic process about half as long again as the thorax with the apex turned up and acuminate, of a dark green colour with white irrorations; body fulvous, the thorax spotted with black; feet black with the four anterior femora pitchy and the two hind femora, fulvous: tegmina and wings marked as in *F. candelaria* (*Westw.*). Body with cephalic process long, 32—38; exp. teg. 63—76 millims.

Reported from Assam: the Indian Museum possesses specimens from Sibságar (Assam) and Sikkim, the latter, as a rule, smaller with the cephalic process of a lighter green and the white irrorations thereon hardly visible.

4. Fulgora spinolæ, Westwood.

Fulgora (Pyrops) spinolæ, Westwood, A. M. N. H., ix, p. 118 (1842).
Fulgora (Hotina) spinolæ, Westwood, Cab. Or. Ent. p. 73, t. 36, f. 1 (1848).
Hotinus spinolæ, Walker, Cat. Hom. B. M. ii, p. 266 (1851).
Fulgora spinolæ, Butler, P. Z. S. p. 98 (1874).

Cephalic process as long as the body with the apex turning up, above black, beneath luteous: body fulvous: anterior margin and the middle of the pronotum, a broad median stripe on the mesonotum, two dots and two oblique, lateral streaks, all black: tegmina brown, veins fulvous; three straight, transverse, bands before the middle and six or seven subapical circular spots (of which some form an interrupted maculate band) palely fuscous; wings, fulvous, black at the apex (*Westw.*). Body with cephalic process long 44; exp. teg. 82 millims.

Reported from Mysore, Assam, Silhat: the Indian Museum possesses specimens from Shillong, Nága hills, Silhat, Sibságar, and Sikkim.

5. Fulgora lathburii, Kirby.

Fulgora lathburii, Kirby, Trans. Linn. Soc. xii, p. 450 (1818); Westwood, *ibid.*, xviii, p. 139 (1841); White, A. M. N. H. xiv, p. 425 (1844); Guérin, Icon. Règne An. Ins. t. 58, f. 2 (1830-34); Butler, P. Z. S. p. 98 (1874).

Flata lathburii, Germar, Thon's Archiv. ii, (2), p. 46 (1830).
Hotinus lathburii, Walker, Cat. Hom. B. M. ii, p. 266 (1851).

Allied to *F. candelaria*, Linn., cephalic process ascending, above black, apex red: dorsum of thorax black: tegmina blackish-green, sprinkled with many ocellate spots having a luteous pupil and a white iris; some white dots on the interior margin: abdomen pallid, spotted black: wings luteous, black at the apex (*Kirby*). Long, 38 millims.

Reported from China, Silhat.

To this section also belong:—

F. cyanirostris, Guérin, A. S. E. F. (2 Ser.) iii, Bull. Ent. p. xcvi, (1845). Java.
F. nigrirostris, Walker, Ins. Saund. p. 29 (1858). Siam.
F. philippina, Stål, Ofvers. K. V.-A., Förh. p. 740 (1870). Philippines.
F. æruginosa, Stål, *l. c.* p. 741 (1870). Philippines.
F. lauta, Stål, *l. c.* p. 741 (1870). Philippines.

Sec. 2. *Species with whitish or white and red wings.*

6. FULGORA CONNECTENS, n. sp.

The coloration of the tegmina connects this fine species with the first section and that of the wings places it in this section. Cephalic process much longer than the body, ascending, much recurved, somewhat sabreshaped, much compressed, much flattened at the apex, black above, greenish-fulvous beneath, signs of faint white irrorations above: thorax black, with a broad, transverse, fulvous band concolorous with the intermediate coxæ and the clypeus: abdomen above sordid fulvescent, beneath black with each segment broadly bordered posteriorly with sordid fulvescent; anus black: feet black, coxæ, intermediate femora above, and entire posterior femora, brown; tegmina black, veins greenish; the basal half with three transverse fulvous bands, of which the third from the base becomes a confluent row of four round fulvous spots, ocellated paler, beyond this in the apical half comes a transverse row formed of two large fulvous ocellated confluent spots near the costal margin and a smaller spot not ocellated near the interior margin, then another interrupted transverse row commencing with four ocellated confluent spots at the costal margin and ending with two confluent ocellated spots at the internal margin; two large and two small fulvous spots not ocellated in the apical fourth: wings white, apex black, with three confluent white spots and two smaller within the black part. Body long to the eyes, 22; cephalic process long from eyes to tip, 30: exp. teg. 80 millims.

The Indian Museum possesses a specimen from Tenasserim.

7. FULGORA CLAVATA, Westwood.

Fulgora clavata, Westwood, Trans. Linn. Soc. xviii, p. 139, t. 12, f. 1 (1841); Cab. Or. Ent. p. 7, t. 3, f. 1 (1848); Butler, P. Z. S. p. 98 (1874).
Hotinus clavatus, Walker, Cat. Hom. B. M. ii, p. 267 (1851).

Cephalic process and head piceous, covered with a white-farinose substance, as long as half the body, gradually attenuated from the base, its dorsum tricarinate and apex turning upwards and ending in a knob or ball sub-rounded, sub-pellucid, and broadly testaceous: thorax luteous, pronotum with two minute discoidal, black, dots; mesonotum with four basal and two other oblique lateral spots: abdomen beneath fulvous, above obscure, dotted with a white farinose substance, apices of segments luteous, anus black: basal half of tegmina somewhat whitish with numerous, irregular fuscous spots; apical half fuscous with numerous whitish circular spots, varying very much in size and most of them ocellated: wings somewhat whitish, apex broadly fuscous: feet and rostrum black; clypeus luteous (*Westw.*). Body with cephalic process long 33½; exp. teg. 76 millims.

Reported from Assam: the Indian Museum possesses specimens from Sikkim, Khasiya Hills, Sibságar, Shillong. In fresh specimens the whole of the tegmina and abdomen above and below is thickly covered with a white powdery substance: the abdomen, too, is of a rich red colour, which fades to fulvous, and the wings at the base are a light blue, which fades to grey. The Indian Museum possesses a remarkable local variety from Mussooree in which the entire cephalic process is dull red and the ground of the tegmina is much lighter.

8. FULGORA PONDEROSA, Stål.

Hotinus ponderosus, Stål, Ofvers. K. V.-A. Förh. xi, p. 244 (1854): Walker, Cat. Hom. B. M. Suppt. p. 315 (1858).

Fulgora ponderosa, Butler, P. Z. S. p. 98 (1874).

Cephalic process half the length of the body, cylindrical, black-piceous, ascending at the apex, which is testaceous: thorax and scutellum yellow-testaceous, the latter with four basal spots and two behind the middle, black: tegmina sordid white, sparingly covered with a white farinose substance; a median band spotted with white; and two spots at the anterior margin before the middle and one at the sutural margin, black; several fuscous spots on the disc and apex, which is spotted white: wings sordidly whitish subhyaline, weakly fuscous at the apex: abdomen yellow testaceous, segments margined testaceous: feet and rostrum black; posterior femora yellow-testaceous beyond the middle (*Stål*). Body long, 38: exp. teg. 88 millims.

Reported from India. There is little doubt that this is merely a variety of *F. clavata*, Westw.

Sec. 3. *Species with red and whitish wings.*

9. FULGORA OCULATA, Westwood.

Fulgora oculata, Westwood, Trans. Linn. Soc. xviii, p. 142, t. 12, f. 5 (1841); Butler, P. Z. S. p. 99 (1874).

Var. *a. Fulgora (Hotina) oculata*, Westwood, Cab. Or. Ent. p. 73, t. 36, f. 2 (1848).

Var. *b. Fulgora subocellata*, Guérin, Rev. Zool. p. 183, (1839); Delessert, Souv. Voy Inde, p. 66, t. 16, f. 1 (1842); Butler, P. Z. S., p. 99, (1874).

Hotinus oculatus, Walker, Cat Hom B. M. ii, p. 267, (1851).

Hotinus subocellatus, Walker, *l. c.* p. 267, (1851); J. L. S. Zool. i, p. 84, (1856).

Cephalic process as long as the body, ascending, slender: pale greyish-fulvous, abdomen and wings clothed with a fine white powdery substance, mesothorax more fulvescent: tegmina greyish fulvous, pale, with about twenty-four ocellated spots, fulvous rings girdled whitish: wings white-farinose, palely virescent at the base with the anterior margin having a large roseate patch in the middle ending in a fuscous spot and another smaller towards the middle: feet palely greyish-luteous; four anterior tibiæ and tarsi and the last tarsi, black (*Westw.*) Long with cephalic process 35; exp. teg. 63 millims.

Reported from India.

Var. *a.* Cephalic process as long as the body, ascending at the apex, brunneous; body greyish luteous, powdered with a white farinose substance: tegmina greyish fulvous, each with 21-30 fulvous ocellated spots, encircled with buff; wings clothed with a white powdery substance, the base pale green, middle of the costa marked with a large rosy patch and followed by a brown streak which is sometimes extended over the whole apex of the wing which is, in such case, marked with several paler spots; legs luteous, the four anterior tibiæ and tarsi and the two hind tarsi, black (*Westw*) Exp. teg. 65-87 millims.

Reported from Malabar, Penang.

Var. *b.* Cephalic process as long as the body, ascending at the apex, obscurely ferruginous above, green beneath: body and feet green, anterior and intermediate tibiæ black; tegmina fulvescent green, subocellated yellow: wings white somewhat green at the base, clothed with a white powdery substance and spotted on the anterior margin with black and ferruginous (*Guérin*). Long, 48; exp. teg, 93 millims.

Reported from Nepál, Penang, Malacca. Guérin keeps this separate as he considers that *F. oculata*, West. is smaller, the spots on its tegmina are tawny, very restricted and surrounded by whitish on grey-tawny ground and its wings are also adorned with a great rosy patch, tipped with brown; characters wanting in his *F. subocellata*. Still comparing the wide differences in the extreme varieties of *F. clavata* this variety cannot at present receive specific rank.

Var. *c.* Spots on the tegmina confluent and of a rosy colour: the green at the base of the wings absent. Var. *verhuelli.*

This section includes also the following:—

F. sultana, Adams, P. Z. S. p. 83 (1847) Borneo.
F. gigantea, Butler, P. Z. S. p. 99 (1874) Borneo.

C. *Species with blue-green wings.*

10. FULGORA AMPLECTENS, n. sp.

This species forms the connecting link between the preceding section and this; the coloration of the tegmina strongly resembles that of the *F. oculata* group and the coloration of the wings places it in this section. Cephalic process as long as the body, somewhat horizontal, gradually ascending somewhat towards the tip, subrotundate above and subequal in size throughout, black-brown throughout, above and beneath, except the tip which is reddish-testaceous and subpellucid, apical half below the tip irrorated with white dots: thorax deep brown, blacker on the disc: abdomen above and beneath, black; posterior margins of the dorsal segments narrowly fulvous: feet brown throughout: tegmina brown, veins fulvous, basal two-thirds finely covered with a white powdery substance above and bright fulvous beneath, this white powdery substance intensified across the base of the apical third so as to form a white band which bears a row of four fulvous spots, a small one and the largest towards the costal margin and two small ones towards the internal margin, four or five very faint similar fulvous spots and very numerous light brown spots are sprinkled over the basal two-thirds: wings blue, apex broadly and external margin less broadly, black, rayed black along the veins towards the base somewhat as in *F. pyrorhyncha*, Don., to which this species is very closely allied, differing chiefly in the coloration of the abdomen and the size, arrangement, and number of the spots on the tegmina. Body long to eyes, 24; cephalic process from eyes, 23; exp. teg. 93 millims.

The Indian Museum possesses a specimen from Perak.

11. FULGORA PYRORHYNCHA, Donovan.

Fulgora pyrorhynchus, Donovan, Ins. Ind. Hem. t. 7, f. 1 (1800): Règne Animal ed Masson, t. 96, f. 2 (n. d).

Hotinus pyrorhynchus, Walker, List Hom. B. M. ii, p. 267 (1851); J. L. S. Zool. x, p. 96 (1867).

Fulgora pyrorhina, Westwood, Trans. Linn. Soc. xviii, p. 139 (1841); in Donovan's Ins. Ind. (2nd ed) p. 13 (1842).

Fulgora rajah, Guérin Rev Zool p. 183 (1839).

Fulgora pyrorhyncha, Butler, P. Z. S. p. 100 (1874).

Cephalic process large, of a dark purple, thickly sprinkled with a white powdery substance, ascending, tip scarlet and somewhat pellucid: tegmina brown, pale across the middle; wings black, green at the base (*Donovan*).

Cephalic process about 25 millims; long, purple, spotted white, ascending; apex incrassated, red; dorsum of abdomen greenish with three black spots on the anterior margin of each segment; lateral margins of thorax and basal margin of scutellum somewhat testaceous: tegmina brown, spotted pale glaucous, and with a paler band, basal half with eleven irregularly placed, round, yellow spots, a pale band with a transverse row of four round spots of a deeper colour approaching fuscous and slightly margined inwardly with yellow and the apical fourth has eight smaller round yellow spots. Guérin describes his *F. rajah* as having the cephalic process as long as the body, ascending, brunneous, apex somewhat dilated, red: body and feet brunneous; tegmina blackish fulvous, spotted with yellow, a broad pallid band at the apex: wings black, blue at the base. Long, 44 millims.

Reported from Nepál (*Don.*); Malacca (*Guér.*).

12. FULGORA MACULATA, Olivier.

Fulgora maculata, Olivier, Enc Méth vi, p 568 (1791); Stoll, *(La Cigale verte porte-lanterne)* Cigales, p. 98, t. 26, f. 143 (1788); Burm. Handb. Ent. ii, (i) p 169 (1835); Westwood, Trans. Linn. Soc. xviii, p. 140 (1841); Duncan's Nats. Lib. 1, p. 284, t. 23, f. 2 (1840); Butler, P. Z S. p 100 (1874).

Flata maculata, Germar, Thon's Archiv ii, fasc. 2, p 46 (1830).

Hotinus maculatus, Walker, Cat. Hom. B. M. ii, p 266 (1851).

Cephalic process almost as long as the body, ascending, recurved; head black; eyes and antennæ grey; thorax brown, shaded with black: abdomen light brown, banded with black, same above and beneath; tegmina above black with interrupted bands or continuous rows of glaucous spots, apical portion irrorated yellowish-green: wings with the basal portion towards the anterior margin and a patch near the anal margin, greenish-blue ending in fine rays, apical portions black: feet deep brown, posterior pair spinose: Body long to the eyes, 21: cephalic process from the eyes 19; exp. teg. 71 millims.

The Indian Museum possesses a specimen from Ceylon.

13. FULGORA FULVIROSTRIS, Walker.

Hotinus fulvirostris, Walker, List Hom B. M. Suppt. p. 41 (1858).

Butler (P. Z. S. p 100, 1874) unites this species with *F. maculata*, Olivier, as a variety, but it is as much entitled to specific rank as *brevirostris*, *viridirostris*, and *spinolæ*, which are similar varieties of *F. candelaria*, Linn. It clearly differs from *F. maculata* in having the cephalic process subpellucid, sordid fulvous-testaceous or tawny instead of opaque deep green; the markings on the tegmina follow the arrangement of the markings on the tegmina in *F. maculata*, but are sordid whitish instead of bluish-white, and the wings are sordid greenish-white rayed with black-fuscous nearly up to the base, the apex being broadly and the external margin less broadly black.

Black: head tawny, cephalic process abruptly curved and ascending, a little shorter than the body, blackish on each side, at the base: pronotum with some dingy whitish or testaceous marks on each side: mesonotum more or less testaceous or whitish on the disc; hind border and abdomen whitish or testaceous, the latter with some irregular and incomplete blackish bands: tegmina with about 20 whitish or straw-coloured spots and dots, some of them connected, forming four very irregular bands: wings white or dingy whitish towards the base (*Walker*). Body long, 27; cephalic process from the eyes, 20; exp. teg. 59 millims.

Reported from Ceylon: the Indian Museum possesses two specimens from Ceylon. It is possible that we should place this and the two next as varieties of *F. maculata.*

14. FULGORA DELESSERTII, Guérin.

Fulgora delessertii, Guérin, Rev Zool p. 183 (1839); Delessert, Souv. Voy Indo, pt. ii, p 66, t. 16, f 2 (1843): Butler, P Z S. p 100 (1874).
Hotinus delessertii, Walker, Cat. Hom. B. M ii, p. 266 (1851).

Cephalic process half the length of the body, ascending, green: prothorax ferruginous: tegmina greenish black, spotted with yellow: wings cærulean, black at the apex (*Guérin*). Long 34; exp. teg. 75 millims.

Reported from the Nilgiris, Malabar.

This species is near to *F. maculata*, Olivier, but differs from it in the coloration of the spots on the tegmina. It differs from *F. candelaria*, Linn. "par les deux facettes latérales de la face frontale qui ont à leur extrémité une carène longitudinale allant du sommet des faces latérales au sommet de la tête." The cephalic process is short and compressed.

15. FULGORA ANDAMANENSIS, Distant.

Fulgora andamanensis, Distant, Trans. Ent. Soc. p. 152, t. 5, f. 7, 7 *a* (1880).

Cephalic process long, slender, ascending, as long as the body; beneath greenish luteous with the apex black, above black, apical two-thirds irrorated with small white spots and a luteous streak on each side within the eyes, which are also luteous; thorax above black, with dull luteous markings; abdomen above pale greenish-luteous, beneath black; coxæ, trochanters, and femora fuscous, the last darkest, tibiæ and tarsi, black. Tegmina black, with the veins pale green and a number of brown spots encircled with pale greenish, arranged thus:—a transverse row of four near the base, the upper three fused together; two irregular transverse rows on the disc, a little nearer together than from the basal row, followed by a straighter transverse row of three smaller ones; remaining apical portion occupied by about twelve spots of which the largest are two fused together on the costa and one with a very small brown centre about the apex of the inner margin: extreme apical spots very small and somewhat indistinct. Wings blue with the apex broadly, and outer margin somewhat narrowly, black. The veins on the blue portion of the wings are green, with the exception of two which are narrowly black at the base (*Distant.*) Long, cephalic process, 20; body 20; exp. teg. 68 millims.

Reported from the Andaman Islands.

Allied to *F. delessertii*, Guérin, and *F. maculata*, Olivier. It somewhat resembles the former in the pattern of the tegmina, but differs in the length of the cephalic process, which in *F. delessertii* is but about half the length of the body. In length and structure of the cephalic process, it is more closely allied to *F. maculata;* the cephalic process, however, is longer than in that species, being about equal to the length of the body; and, besides the different pattern of the tegmina, the wings are much more narrowly black along the posterior margin. The Indian Museum possesses a specimen from the Nicobar islands which appears to differ from the type figured by Distant in the cephalic process being longer, more distinctly ascending and recurved, and in the absence of white spots on the upper two-thirds. The markings on the tegmina are the same and do not differ more than individuals of allied species differ from each other. The wings are marked much as in *F. delessertii* Guérin, the outer margin is more broadly suffused with blackish than in the type and the blackish extends further towards the base in rays.

16. FULGORA CURTIPRORA, Butler.

Fulgora curtiprora, Butler, A. M. N. H. (4 ser.) xiv, p. 131, (1874).

Closely allied to *F gemmata*, West., but with the cephalic process one-third shorter and the colouring different: tegmina with the corium bright green speckled with black, area beyond black; the veins green, becoming ochraceous near the apex; entire surface covered with small orange spots: wings shining black, varied with pale transparent green as in *F. gemmata:* cephalic process, head, and thorax testaceous, thorax spotted with black; abdomen black, segments edged with green above, with ochreous below; legs and anus red (*Butler*). Body long with cephalic process, 23; cephalic process, long 8½; exp. teg. 50 millims.

Reported from Sikkim.

17. FULGORA GUTTULATA, Westwood.

Fulgora (Pyrops) guttulata, Westwood, A M. N. H. ix, p. 119 1842).
Fulgora (Hotina) guttulata, Westwood, Cab Or. Ent p. 8, t. 3, f. 3 (1848).
Pyrops guttulata, Walker, List Hom. B. M. ii, p. 269 (1851).
Fulgora guttulata, Butler, P. Z. S., p. 101 (1874).

Cephalic process about half as long as the thorax, its apex slightly bent upwards and acute; head and thorax above of a fulvous clay-colour dotted with black: segments of the abdomen brown at the base: tegmina pale fulvous clay-coloured, gradually assuming a redder tinge beyond the middle with a great number of small pale buff dots edged with a black ring, the wings very pale yellowish, with a few black dots and a broad dark brown margin (*Westw.*) Body long with cephalic process, 25; exp. teg. 50 millims.

Reported from N. India.

The rostrum is very long and slender and extends to the end of the body, separated from the genæ by a transverse raised line, between which and the eyes is a black dot. The four anterior legs have a black ring at the base of the tibiæ, the apex of which and the tarsi are also black, the underside of the body and the hind legs are entirely fulvous with two small black spots at the base of the coxæ and two long black spots at the sides of the penultimate abdominal segment.

18. FULGORA GEMMATA, Westwood.

Fulgora (Hotina) gemmata, Westwood, Cab. Or Ent. p. 7, t. 3, f. 2 (1848).
Hotinus gemmatus, Walker, Cat. Hom. B. M. ii, p. 267 (1851).
Fulgora gemmata, Butler, P. Z. S. p. 101 (1874).

Head and thorax fulvous with black markings; abdomen above black with posterior margins of the segments narrowly green; tegmina green at the base which gradually changes into a dark brownish crimson; they are entirely covered with minute black dots, each tegmen being ornamented with about 30 bright orange spots; the wings are green, with a broad black border, which extends into the disc of the wing, forming several large, black blotches; legs, dark red (*Westw*). Body long exclusive of cephalic process, 19; exp. teg. 28 millims.

Reported from Himálaya, N. India, Darjiling: the Indian Museum possesses specimens from Sikkim, Khasiya Hills, Assam. There is also a specimen in which the orange spots on the tegmina are obsolete and are replaced by roundish black rings with the centre of the ground colour of the tegmina; the wings are precisely the same.

To this section also belong the following species:—

F. ducalis, Stål, Trans. Ent. Soc (3 ser.) i. p 576 (1863). Cambodia.
F. cœlestina, Stål, l. c p. 576 (1863). Cambodia.
F. intricata, Walker, J L S. Zool i, p 132 (1857) Borneo.
F. stellata, Butler, P. Z S p 100 (1874). Borneo.

Sec. D. *Species with scarlet wings.*

19. FULGORA CARDINALIS, Butler.

Fulgora cardinalis, Butler, A. M. N. H. (4 ser.) xiv, p. 13[illegible] (1874).

Tegmina yellowish-olivaceous, veins and costal area bright green; entire surface covered with black-edged orange spots, arranged as in *F. virescens*, West., but larger and better defined; outer margin brown: wings carmine; outer margin brown, broadest at the apex: cephalic process, head and prothorax above, and the entire pectus green, spotted with black; meso- and meta-thorax testaceous, black-spotted; abdomen above reddish, below testaceous, varied with emerald-green: legs emerald-green (*Butler*). Body including cephalic process, 25; cephalic process 8½: exp. teg. 53 millims.

Reported from Nepál, Sikkim. Allied to *F. pyrrhochlora*, Walker, and *F. virescens*, Westw., but differing structurally from both in its short abruptly compressed cephalic process. The Indian Museum possesses specimens from Sikkim.

To this section also belong the following species:—

F. coccinea, Walker, List Hom. B. M. Suppt p. 42 (1858). Ceylon.
F. decorata, Westwood, Trans Linn. Soc. xviii, p. 141, t. 12, f. 4, (1841). Java.
F. guttifera, Stal, Ofvers. K. V.-A., Forh. p 448 (1859). Ceylon, Shanghai?
F. pyrrhochlora, Walker, Butler, P. Z. S. p. 101 (1874). Borneo.

Sec. E. *Species with pale greenish wings (subhyaline).*

20. FULGORA VIRESCENS, Westwood.

Fulgora (Pyrops) virescens, Westwood, A. M. N. H. ix, p. 119 (1842).
Fulgora (Hotina) virescens, Westwood, Cab. Or. Ent. p. 8, t. 3, f. 5 (1848).
Pyrops virescens, Walker, Cat. Hom. B M. ii, p 209 (1851).
Hotinus semiannulus, Walker, l. c. Suppt. p. 42 (1858).
Fulgora virescens, Butler, P. Z. S. p. 102 (1874).

Cephalic process short, conical, scarcely bent upwards: entirely pale green with a minute black spot on each side of the prothorax and scutellum; the tegmina broad with the anterior margin much arched, green with numerous small rounded orange-coloured spots, outwardly edged with black; wings very pale green and semitransparent (*Westw.*). Body long with the cephalic process 19—20: exp. teg. 56—58 millims.

Reported from India, Silhat: the Indian Museum possesses a specimen from Silhat.

To this section also belongs the following species:—

F. cultellata, Walker, J. L. S. Zool. i, p. 143 (1857). Borneo.

Genus ALCATHOUS, Stål.

Trans. Ent. Soc. (3 Ser.) i, p. 577 (1863).

Head much narrower than the thorax, protuberant, frons somewhat roundly-amplified near the apex, thence distinctly narrowed upwards, tricarinate; clypeus carinate in the middle: rostrum almost reaching the apex [illegible]he abdomen: antennæ short, second joint very briefly subcylindrical, obliquely truncated at the apex. Thorax unicarinate in the middle, somewhat produced anteriorly in the middle, produced part truncated, posterior margin, straight: scutellum tricarinate, twice as long as the thorax. Tegmina somewhat amplified towards the apex which is obtusely obliquely rounded, longitudinal veins rarely furcate, interior simple, only third apical part furnished with remote, transverse, small veins, irregularly anastomosed: wings with more than the basal half without transverse veinlets. Feet moderate, anterior femora beneath slightly dilated, posterior tibiæ, 5—6 spinose (*Stål*). Allied to *Fulgora*.

21. ALCATHOUS FECIALIS, Stål.

Alcathous fecialis, Stål, Trans. Ent. Soc. (3 ser.) i, p. 577 (1863).

Livid, dorsum of abdomen and coccineous wings excepted, minutely sprinkled fuscous, here and there infuscate: tegmina clouded fuscous with small costal spots, apex of wings, broad posterior limbus and some spots near the anal area, two rows of spots on the dorsum of the abdomen and rings on the tibiæ blackish; femora fuscescent, obscurely irrorated, banded palely ♀, long, 15; exp. teg. 32 millims.

Head a little shorter than the thorax and scutellum together, produced part somewhat subabruptly narrowed and compressed before the eyes, before the middle transversely impressed and somewhat reflexed; vertex at the base more than twice as broad as the transverse eye, basal half triangular, apical part very narrow; frons flat beneath the middle, furnished with three parallel ridges, the median ridge interrupted in the middle; transverse veinlets on the tegmina are subrufescent (*Stål*).

Reported from N. India.

Genus PYROPS, Spinola.

A. S. E. F. viii, p. 231 (1839); Am. & Serv., Hist. Nat. Ins. Hém. p. 491 (1843); Stål, Hem. Afric. iv, p. 133, 139 (1866).

Head produced forwards, in a long process, somewhat rounded, gradually very slightly somewhat slender, straight, obliquely truncated at the apex; the lateral part behind the eyes furnished with a subconical or triangular callus or knob; vertex transversely convex, continued up to the apex of the process; genæ rounded anteriorly: eyes small;

second joint of antennæ short, thick. Pronotum and scutellum fairly convex transversely, without ridges, the former gradually narrowed forwards, barely or very slightly sinuated at the base. Entire tegmina or the largest portion reticulated, valvate behind the clavus. Feet somewhat thick and short; first tibiæ, femora, and trochanters together equal in length, last armed with 5—7 spines (*Stål*).

22. Pyrops punctata, Olivier.

Fulgora punctata, Olivier, Enc. Méth. vi, p. 569 (1791); Stoll, Cigales, p. 34, t. 6, f. 28 (1788); Gray, Griffith's An. King. t 138, f. 2 a-c (1832).

Flata punctata, Germar, Thon's Archiv. ii (2), p. 47 (1830).

Fulgora affinis, Westwood, Trans. Linn. Soc. xviii, p. 144, t. 12, f. 6 (1841).

Pyrops punctata, Spinola, A. S. E. F. viii, p. 237 (1839); Walker List Hom. B. M. ii, p. 268 (1851).

Cephalic process almost as long as the body, truncated at the apex; luteous-greyish; thorax, feet, and tegmina sprinkled with black dots: abdomen above black: wings white, veins pallid. Head, cephalic process, pro- and meso-notum and tegmina pale luteous, sprinkled with black dots, varying in size: cephalic process almost as long as the body, almost straight, subcylindrical, obliquely truncated at the apex, fuscous-luteous, rough with dots, paler at the apex: the black dots on the tegmina disposed longitudinally on the veins: wings white, subopaque, a little infuscate towards the apex, veins paler, except at the base: abdomen black, with the narrow margin of the segments, luteous; feet short, luteous; femora with a subapical ring; tibiæ with three black rings (*F. affinis*, Westw.). Body long with cephalic process, 33½; exp. teg. 55 millims.

Reported from China, Nepal, Silhat, Ceylon, Java, Guinea (?): the Indian Museum possesses specimens from Sikkim.

23. Pyrops perpusilla, Walker.

Pyrops perpusilla, Walker, List Hom. B. M. ii, p. 269 (1851).

Body stramineous; head with its process as long as the rest of the body; abdomen luteous above: legs yellow; tegmina very pale stramineous; a few brown dots on the veins near the tip and along the hind border which is somewhat darker than the rest of the wing; a rather large dot in the disc on the fork of one of the longitudinal veins: wings colourless, veins pale yellow (*Walker.*) Body long 8½; wings, long 9 millims.

Reported from N. Bengal.

Genus HOMALOCEPHALA, Amyot & Seville.

Omalocephala, Spinola, A. S. E. F. viii, p. 261 (1839) ; *Homalocephala*, Am. & Serv., Hist. Nat. Ins. Hém. p. 492 (1843) ; Stål, Hem. Afric. iv, pp. 133, 145 (1866).

Head broad, somewhat narrower than the thorax, produced before the eyes, round or triangular; behind the eyes prominulous backwards in a short, thick spine: vertex at least four times broader than the eyes, flat or somewhat so: frons flat somewhat broader than the clypeus, sides parallel, very slightly amplified towards the apex; clypeus without a median ridge: rostrum reaching the last coxæ. Thorax broadly rounded anteriorly, furnished with a fine longitudinal ridge: scutellum more than twice as long as the thorax. Tegmina with the sides parallel, obliquely obtusely rounded at the apex, very densely reticulated, reticulation in the costal area obsolete, claval vein united with the commissure at the apex of the clavus: wings entire. Feet somewhat short, simple; first tibiæ as long as the femora, last armed with 3—4 spines (*Stål*).

24. HOMALOCEPHALA FESTIVA, Fabricius.

Fulgora festiva, Fabricius, Spec Ins ii, p. 315 (1781) ; Mant. Ins. ii, p. 261 (1787) ; Olivier, Enc. Méth. vi, p. 572 (1791) ; Fabr., Ent. Syst. iv. p. 5 (1794) ; Syst. Rhyng. p 4 (1803) ; Donovan, Ins. India, Hem. t. 7, f. 2 (1800).

Omalocephala festiva, Spinola, A. S. E. F. viii, p. 261 (1839) ; Walker, List Hom. B. M. ii, p. 283 (1851).

Homalocephala festiva, Am. & Serv., Hist. Nat. Ins. Hém. p. 493 (1843).

Head above flat, fuscous; beneath flavescent, with a black margin: thorax fuscous, immaculate: tegmina fuscous, exterior margin virescent, which colour, however, does not reach the apex of the wing: there are five black dots along this margin of which the four posterior end inwards in a fulvous dot: wings sanguineous, fuscous at the apex (*Fabricius*)

Head above flat, obscure; beneath, yellowish, border black: thorax obscure immaculate: tegmina obscure with the costal margin greenish which does not extend to the apex, on this part are five black spots of which the four posterior are bounded internally by a tawny spot: wings sanguineous with the apex obscure (*Olivier*). Donovan states that the tegmina have a green margin on which there are a few black spots semicircled with orange. Long, 17 millims.

The Indian Museum possesses a very mutilated specimen.

Genus LIMOIS, Stål.

Stettin Ent. Zeit. xxiv, p 230 (1863) : Hem. Afric. iv, p 134 (1866).

Head narrower than the thorax, slightly protuberant upwards; frons longitudinally convex, abruptly dilated on both sides at the apex, much narrowed upwards, bicarinate lengthways, lateral margins reflexed beneath the middle; vertex transverse; clypeus carinate in the middle, lateral margins obtuse, obtusely carinate; thorax twice as broad as the head, somewhat sloped forwards, broadly truncate posteriorly, obsoletely carinate in the middle: tegmina somewhat amplified towards the apex, which is obliquely obtusely rounded, furnished behind the middle with remote small transverse veins: wings sinuate in the middle, posteriorly, much shorter than the tegmina: feet moderate, simple; posterior tibiæ 5-spinose (*Stål*). Differs from *Aphana* in the structure of the head and the short wings.

25. LIMOIS WESTWOODII, Hope.

Lystra westwoodii, Parry, Hope, Trans. Linn. Soc. xix, p. 133, t. 12, f. 3 (1845); Walker, List Hom. B. M. ii, p. 286 (1851).

Limois westwoodii, Stål, Stettin Ent. Zeit. xxiv, p. 231 (1863).

Fuscous yellow, cephalic process concolorous, recurved between the eyes; frons almost triangular, elongate: basal half of tegmina fuscous yellow, sprinkled with fuscous spots, varying in size: wings at the base sanguineous and margined by a narrow black line and with three black spots, remainder immaculate, hyaline: body beneath black. (*Hope.*) Body long, 12½; exp. teg. 48 millims.

Reported from Silhat: the Indian museum possesses a specimen from Calcutta, expanse of tegmina under 40 millims.

Genus APHANA, Guérin, Stål.

Aphæna, Guérin, Voy. Bélanger, Ind. Orien. p. 451 (1834); Spin., A. S. E. F. viii, p. 240 (1839): *Aphana*, Burm., Handb. Ent. ii (i) p. 166 (1835); Amyot & Serville, Hist. Nat. Ins. Hém. p. 496 (1843); Stål, Stettin, Ent. Zeit. xxiv, p. 231 (1863); Hem. Afric. iv, p. 134 (1866).

Head not protuberant; frons slightly narrowed upwards or with the sides parallel, lateral margins more or less distinctly broadly bisinuate with two ridges running through them, diverging upwards from the apex, terminating on both sides the median area: thorax with a ridge very often much elevated: first femora not amplified above at the apex; last tibiæ usually 5-spinose, unarmed above at the base (*Stål*).

26. APHANA FARINOSA, Fabricius.

Lystra farinosa, Fabricius, Syst. Rhyng. p. 57 (1803): Germar, Thon's Archiv, ii (fasc. 2) p. 52 (1830).

Aphæna farinosa, Spinola, A. S. E. F. viii, p. 244 (1839); Walker, List Hom. B. M. ii, p. 274 (1851).

Aphana scutellaris, White, A. M. N. H. xvii, p. 330 (1846).

Aphæna scutellaris, Westwood, Cab. Or. Ent., p. 73, t. 36, f. 3 (1848); Walker, List Hom. B. M. ii, p. 277 (1851)); J. L. S. Zool. i, p. 143 (1857); var. l. c. x, p. 96 (1867).

Aphæna saundersii, Walker, List Hom. B. M. ii p. 277 (1851); J. L. S. Zool. i. p. 84 (1856); l. c. p. 143 (1857).

Aphana farinosa, Burm., Handb. Ent. ii (2), p. 166 (1835); Stål, Ofvers. K. V.-A. Förh., p. 485 (1862); Stettin Ent. Zeit., xxiv, p. 232 (1863).

Fuscous; tegmina yellow at the apex; base of the wings and the abdomen, red, the former spotted hyaline (*Fabr.*). Head, pronotum, and border of the tegmina, reddish-brown, the under half of the same black, apex golden yellow, powdered white: wings with a red ground with small white spots; tip brown: feet, black (*Burm.*). Larger than *A. atomaria*, Fabr. greenish-brown; occiput excavated and marked with two whitish powdery spots between the eyes; the pronotum with an elevated ridge down the middle, the scutellum powdered with white, the metathorax blackish; the margins of the abdominal segments luteous-green, the base powdered with white; the basal half of the tegmina ferruginous, the disc powdered with white, and with an irregular black fascia in the middle and some blackish spots near the hind margin, the apical portion horn-coloured, varied with buff, hind-wings orange red, spotted with white, the base black, the apical portion horn-coloured, and the anal angle buff; body beneath, and legs, pitchy (*Westwood*). Body long, 22; exp. teg. 52½—66 millims.

Reported from Borneo, Java, Sumatra, India (*Spin.*): the Indian Museum has a much abraded specimen from Sinkip Island. The type described by White was from Borneo and varies in the green colour of the basal portion of the costa and the base of the tegmina. Westwood's specimen was from Java and the Indian specimen agrees best with his description.

27. APHANA ATOMARIA, Weber.

Cicada atomaria, Weber, Obs. Ent. p. 113 (1801).

Lystra atomaria, Fabricius, Syst. Rhyng., p. 57 (1803); Germar in Thon's Archiv. ii (fasc. 2), p. 52 (1830).

Aphæna nigro-punctata, Guérin, Voy. la Coquille, Zool. ii, (2), p. 185 (1830); Spin., A. S. E. F. (1 sér.) viii, p. 248 (1839); Am. & Serv.. Hist. Nat. Ins. Hém. p. 497, (1843); Walker, List. Hom. B. M. ii, p. 274 (1851).

Aphæna atomaria, Spin., l. c. p. 248 (1839); Walker, l. c. p. 277 (1851); J. L. S. Zool. x, p. 96 (1867).

Aphana atomaria, Burm., Handb. Ent. ii (i) p. 167 (1835); Stål, Stettin Ent. Zeit. xxiv, p. 232 (1863); Hem. Fabr. ii, p. 87 (1869).

Fuscous, vertex and pronotum brick-colour: tegmina ferruginous, spotted black, abdomen above and wings sanguineous, the latter black at the apex and spotted black-hyaline (*Fabr.*). Head and pronotum ochreous; mesonotum reddish-brown: tegmina of a red brown in the basal two-thirds with two large black spots on the external margin, another towards the end of the second third, in the middle; two other smaller black dots, one at the base and the other towards the end of the first third near the internal margin, and other smaller black dots sprinkled here and there: the apical third of the tegmina sordid yellowish or dull brown: wings bright red with the apex black, sprinkled with bluish spots or patches, the red disc also has four white patches, of which one is very small, with some dozen round black dots strewn about behind them: abdomen red above: body and feet, beneath, reddish-brown (*Am. & Serv.*) Long, 17; exp. teg. 46 millims.

Reported from Sumatra, Java, N. India: the Indian Museum possesses one abraded specimen exactly agreeing with the above desscription, locality unknown, and another from Marri (Panjab). There is a series from Sikkim agreeing in most respects except that the base of the wings is ochreous not sanguineous.

28. APHANA PULCHELLA, Guérin.

Aphœna pulchella, Guérin, Voy. la Coquille, Zool. ii (2), p. 189 (1830); Spinola, A. S. E. F. viii, p. 294 (1835); Walker, List Hom. B. M., ii, p. 274 (1851); Stål, Ofvers. K. V.-A., Förh. p. 485 (1862); Java.

Aphana confucius, White, A. M. N. H. xviii, p. 24 (1846): China.

Aphœna confucius, Walker, l. c. p. 280 (1851): China.

Aphœna io, Walker, List Hom. B. M. ii, p. 279 (1851): N. India.

Aphana nigro-irrorata, Stål, Ofvers. K. V.-A. Förh. p. 244 (1854): China.

Aphœna nigro-irrorata, Stål, Freg. Eng. Resa, Ins., p. 270 (1859): Hong-Kong.

Aphana pulchella, Stål, Stettin Ent. Zeit., xxiv, p. 232 (1863).

Smaller than *A. atomaria*, Fabr., from which it differs in not having the head and thorax yellow, by the tegmina spotted with irregular black dots and the feet yellowish, annulated blackish. Head pro- and meso-notum yellowish punctured grey; metanotum and abdomen vermillion, two small black spots on the former and weak black bands on the three first segments of the abdomen, which also show traces of being covered with a white cottony substance: head and thorax beneath of a fairly deep yellowish-brown with a white patch between the intermediate and posterior coxæ: abdomen beneath ochreous yellow, punctured black, the lateral margin of each segment with a black excavation, filled with a white powdery substance; feet brown, annulated yellow. Tegmina of a somewhat faded saffron-yellow, semitransparent, more yellow towards the apex, covered with numerous small black dots, a few larger; towards the tip and the interior margin a whitish quadrate spot, followed at the posterior and external angle by a brown patch confluent with the small black dots of the apex: wings vermillion, carmine towards the base and a little orange in the middle and on the side of the anterior border: tip with a large black patch, adorned with small blue spots; posterior margin slightly infuscate and disc with 16—17 small, nearly equal, black spots and four small white spots placed in the orange portion (*Guérin*). Long, 15: exp. teg. 37 millims.

The Indian form (*A. io*, Walker) is thus described:—

Body yellowish-brown; head and mesonotum punctured black, carinate; rostrum brown, as long as the body; metanotum, red; abdomen bright red; beneath, spotted black with a black stripe along each side and a brown posterior margin on each segment: legs black, femora and tibiæ flavo-annulate, posterior tibiæ spinose: tegmina yellowish-brown with numerous black marks which are confluent and form a black spot at the tip of the hind border; this spot has a yellowish-white spot adjoining; wings luteous, red at the base and along the inner border, with about 12 black and 4 white spots, brown along the hind border, terminating in a very large black spot which has a blue disc (*Walker*). Body long, 16½; exp. teg. 46 millims.

Reported from China, Java, India: the Indian Museum possesses specimens from Sikkim and the Andamans.

29. APHANA VARIEGATA, Guérin.

Aphæna variegata, Guérin, Voy. Bélanger Ind Orién. Zool. p 455 (1834); Icon. Règne Anim, t 58, f. 3 (1830-34); Spin., A S. E. F. viii, p. 247 (1839); Walker, List Hom. B. M. ii, p. 278 (1851).

Penthicus variegatus, Blanchard, Hist. Nat. Ins. iii, p. 171, Hém. t. 12, f. 4 (1840-41).

Aphæna basirufa, Walker, List Hom. B. M ii, p. 278 (1851) J. L. S. Zool. i, p. 143 (1857).

Aphana variegata, Am. & Serv, Hist. Nat. Ins. Hém. p. 497, t. 9, f. 1 (1843); Stål, Stettin Ent. Zeit, xxiv, p. 232 (1863)

Head flat in front, with two slightly elevated ridges: pronotum transverse, anterior border lobed and a little advanced, carinate in the middle, with a hollow on each side behind the median lobe, and a little emarginate posteriorly: mesonotum triangular, sides almost equal, pointed behind, tricarinate in the middle, one ridge longitudinal, and two lateral, curved: metanotum and abdomen bright red, separated by a white, farinose, transverse band; the head, pro-, and meso-notum brown, touching on deep olive-green. Tegmina brunneous, a little reddish at the base, more greenish at the tip with black patches and round black dots which increase in size towards the apex; two square yellowish patches at the middle third, one on the anterior, the other on the interior margin: wings much broader, a little sinuated on the posterior margin; the base up to one-third of their length bright red with three black spots and an obscure patch; middle third orange yellow grounded with red, above 2-3 small white dots and below a small black spot: the apex is black with more or less numerous or confluent small blue dots; posterior margin from this black portion to the internal angle is broadly bordered brown. Body beneath concolorous with the thorax, feet more blackish (*Guérin*). Long, 20; exp. teg. 55 millims.

Reported from Cochin-China, Philippines, Silhat: the Indian Museum possesses specimens from Sikkim.

30. APHANA CAJA, Walker.

Aphæna caja, Walker, List Hom. B. M. ii, p. 278 (1851).
Aphana caja, Stål, Stettin Ent. Zeit. xxiv, p. 235 (1863).

Fuscous-ochraceous; thorax palely granulate towards the sides; tegmina fawn-colour or palely olivaceous, clouded with black-fuscous and sprinkled with minute black-fuscous spots, further, behind the middle, adorned with a pallid subquadrate spot at the costal and commissural margins: wings croceous, sanguineous at the base, a small oblique, basal streak and 5-7 spots in anal half, black-fuscous; 3-4 small white discoidal spots in the anterior area; posterior limbus narrowly fuscous; apical part black-fuscous, sprinkled with glaucous-mouldy spots; abdomen sanguineous, dorsum with a double row of black spots, beneath fuscous-sanguineous: feet spotted olivaceous. ♀, long 21; exp. teg. 62 millims.

Nearly allied to *A. variegata*, Guérin, but larger, spots on the tegmina larger, wings sanguineous only at the base, posterior fuscous limbus narrower and especially with the vertex shorter, nearly thrice broader than long, more obtusely rounded, transverse basal keel straight, anterior margin less deeply sinuate in the middle: frons subequal at the base and the apex, not distinctly narrower at the base, anterior produced part of thorax more obtusely rounded. Frons somewhat longer than broad, lateral margins slightly broadly bisinuate, with two obtuse ridges diverging upwards and with an obsolete longitudinal ridge towards the base, the median area at the base very broadly rounded: thorax marked before the middle with two obsolete pallid spots (*Stål*).

Reported from Silhat.

31. APHANA DIMIDIATA, Hope.

Lystra dimidiata, Hope, Trans Linn. Soc. xix, p. 133, t. 12, f. 4 (1845); Walker, List Hom. B. M. ii, p. 286 (1851).
Aphana dimidiata, Stål, Stettin Ent. Zeit xxiv, p. 232 (1863).

Fuscous; head, thorax, and feet concolorous: basal half of tegmina virescent, sprinkled with numerous minute dull black spots, apices sub-orange-hyaline marked with cretaceous spots: basal half of wings greenish with the posterior part whitish, spotted black, apices fuscous, irrorated with virescent spots (*Hope*). Long 14½: exp. teg. 46 millims.

Reported from Silhat.

32. APHANA NICOBARICA, Stål.

Aphana nicobarica, Stål, Berlin Ent. Zeitschr xiii, p. 241 (1869).

Sordid olivaceous-green: scutellum, pectus, abdomen, and feet black-fuscous: tegmina before the middle æruginous, sprinkled with black; behind the middle, ochraceous, marked with a band and mouldy spots; apical limbus, black; wings, black, a very large basal spot cœrulean-virescent. Long 19; exp. teg. 55 millims, ♀.

Size of *A. farinosa*, Burm., from which it differs in the head produced anteriorly, seen from above equal in length and breadth between the eyes, roundly-angulated; frons longer, furnished with a recurved process. Frons rugulose, tumescent at the base and with a median process short, compressed, recurved, obsoletely tricarinate, the ridges diverging upwards, the median ridge disappearing below the middle: vertex narrowed forwards, obsoletely carinate in the middle; lateral margins dilated, elevated: thorax furnished with a raised, acute ridge, running through it, strongly bi-impressed on the disc, scutellum tricarinate. The æruginous half of the tegmina covered with minute and often confluent black dots, closer at the apex; apical half ochraceous with the apical limbus black; the spots and an anterior band clothed with a white powdery substance: wings black with a large basal patch extended a little beyond the middle, cærulean-virescent. Apical margins of the dorsal segments of the abdomen, green (*Stål*).

Reported from the Nicobars.

33. APHANA (?) DIVES, Walker.

Aphæna dives, Walker, List Hom. B. M. ii, p 280 (1851).

Body dark ferruginous; disc of the vertex rather concave, borders slightly ridged, fore margin slightly inclined upwards: rostrum extending far beyond the posterior coxæ, dark brown: mesonotum with a slight longitudinal furrow, fore-border very undulating; a black band along the fore-border of the scutellum; metanotum black: abdomen obconical, larger than the thorax, black above, thickly covered with white down, red beneath: legs black, sulcated, femora brown, posterior tibiæ spinose: tegmina green, adorned between the veins with orange streaks which are interrupted by very numerous brown dots, the latter are sometimes confluent; a tawny slightly curved band separates this part from the reticulated tips which are brown with tawny veins: wings green, with numerous brown spots, gray mingled with white towards the tips, white along the inner border (*Walker*). Long, 14½: exp. teg. 42 millims.

Reported from Malabar.

34. APHANA (?) ALBIFLOS, Walker.

Aphœna albiflos, Walker, List Hom. B. M. ii, p. 280 (1851).

Body above, green; beneath, bright-red; vertex tawny, indistinctly carinate along the border; face slightly carinate; rostrum nearly as long as the body, tip black; a concavity corresponding to the eye on each side of the fore-border of the pronotum of which the anterior portion of the lateral margins is black, posterior margin, tawny; longitudinal ridge almost obsolete: abdomen obconical, much longer than the thorax, thickly covered with white down: legs ferruginous, sulcated; femora, red; posterior tibiæ slightly spinose: tegmina black, adorned with numerous little green marks; reticulated part, ferruginous; wings brown, adorned with bluish-green spots, white at the tips and along the posterior margin (*Walker*). Body long, 16½; exp. teg. 55 millims.

Reported from Malabar.

Genus LYCORMA, Stål.

Stettin, Ent. Zeit. xxiv, p. 232 (1863): part *Aphœna*, Guérin.

Head somewhat protuberant, protuberance very short, reflexed: frons, distinctly upwards and at the base more narrowly, furnished with two parallel obtuse ridges, sometimes obliterated beneath the middle; vertex truncated at the base, last angles not produced: thorax finely carinate in the middle: first femora not amplified at the apex above: last tibiæ armed with 4-5 spines; unarmed at the base, above (*Stål*).

35. LYCORMA IMPERIALIS, White.

Aphana imperialis, White, A. M. N. H. xvii, p. 330 (1846).

Aphœna imperialis, Westwood, Cab. Or. Ent. p. 74, t. 36, f. 4 (1848); Walker, List Hom. B. M. ii, p. 282 (1851).

Aphœna placabilis, Walker, l. c. Suppt. p. 46 (1858).

Lycorma imperialis, Stål, Ofvers. K. V.-A. Förh. p. 485 (1862); Stettin Ent. Zeit. xxiv, p. 232 (1863).

Tegmina olive-green, the basal portion with numerous black spots, most of which are traversed by green veins; the tip black, beautifully reticulated with olive-green: wings, at the base, purplish madder with

11—12 large black spots, the purplish part reticulated with whitish; the end brownish-black; a bluish-green band-like mark across the middle of the wing, not nearly reaching the hind margin, the three nerves traversing it are black; tegmina and wings beneath almost same as above: head and thorax above greenish; prothorax finely, transversely striated, a line, down the middle, shining: abdomen black, margins yellow, segments slightly powdered with white, vulvar scales red: legs brown, tibiæ of hind legs tridentate on the outside (*White*). Exp. teg. 61 millims.

Reported from Silhat: the Indian Museum possesses specimens from Sikkim. Red: metanotum black: abdomen with a red transverse line at the base; tip red beneath: tegmina with black spots along the costa and with some more or less interrupted and irregular black bands; more than one-third of the apical part black with very numerous and regular black veins and veinlets: wings black, basal half red with several black spots; a white middle band, not extending to the hind border (*A. placabilis*, Walker). Body long 16½; teg. 54½ millims. This is the reddish-brown variety.

36. LYCORMA PUNICEA, Hope.

Lystra punicea, Hope Trans. Linn. Soc. xix, p. 133, t. 12. f. 5 (1843); Walker, List Hom. B. M. ii, p. 286 (1851).

Aphæna delectabilis, Walker, l. c. Suppt. p. 44 (1858).

Lycorma punicea, Stål, Stettin Ent. Zeit. xxiv, p. 232 (1863).

Reddish purple, head and thorax paler; basal half of tegmina tinted rosy and sprinkled with numerous black spots; apex hyaline fuscous-puniceous with a pellucid mark in the middle of the disc: wings puniceous at the base, marked by black spots, whitish in the middle and fuscous-hyaline, at the apex (*Hope*). Long 12½; exp. teg. 48 millims.

Ferruginous brown, black beneath: antennæ bright red; pronotum dull green with some very minute, testaceous, brown-bordered spots: abdomen black: hind borders of the segments luteous on each side, beneath: legs black: tegmina black, whitish green with black spots for about one-third from the base, outline of the green part much excavated with some streaks same hue near it; veins green: wings bright red with black spots, apical part blackish brown, divided from the red part by a bright greenish blue band which does not extend to the hind margin. (*A. delectabilis*, Walker). Body long, 12½; exp, teg. 42 millims.

Reported from N. China, Shanghai, India, Silhat. The Indian Museum possesses a mutilated specimen from the Dikrang valley, Assam.

37. LYCORMA IOLE, Stål.

Lycorma iole, Stål, Stettin Ent. Zeit. xxiv, p. 234 (1863).

Blackish: the lateral posterior blotch on the vertex, thorax, lateral margins of scutellum, and the tegmina more or less purely green-olivaceous, the tegmina with 23-28 largish black spots, barely third apical part black, green-veined: wings coccineous with 8-10 black spots, black-fuscous behind the middle and there with a shortened band, virescent or cærulescent; anal valvules in ♀ sanguineous (*Stål*). ♀ long, 17; exp. teg. 52 millims.

Reported from India: closely allied to *L. delicatula*, White, larger, cephalic process less prominulous, and the spots on the tegmina and wings larger.

38. LYCORMA DELICATULA, White.

Aphana delicatula, White, A. M. N. H. xv, p. 37 (1845).

Aphæna delicatula, Walker, List. Hem. B. M. ii, p. 282 (1851).

Aphæna operosa, Walker, l. c. Suppt. p. 46 (1858).

Lycorma delicatula, Stål, Ofvers. K. V.-A. Förh. p. 485 (1862); Stettin Ent. Zeit. xxiv, p. 232 (1863).

Tegmina very pale greenish brown, basal part with many black spots (at least twenty) of which six on the anterior margin: the end darker brown, beautifully reticulated with pale greenish brown: wings at the base, vermillion red with largish black spots, irregular on either side (at least seven), tip widely black; a large acutely triangular sea-green mark on the fore-edge between the red and black parts: antennæ orange: head and thorax above of a pale brownish colour with a sort of bloom over them: body and legs blackish brown with a slight bloom (*White*). Exp. teg. 41 millims.

Reported from Nankin, Canton, China: very doubtfully from Sibságar (Assam). The cephalic process in this species is a little more elevated than in *L. imperialis*, White, to which it otherwise bears a strong resemblance: the black spots on the wings and tegmina also are smaller, the tegmina are palely olivaceous or whitish fawn-colour: the median band on the wings varies, as in all the others of this group, from whitish to cærulescent or virescent (*Stål*).

Genus EUPHRIA, Stål.

Stettin Ent. Zeit. xxiv, p. 232 (1863); part of *Aphæna*, Guérin.

Head furnished with a cephalic protuberance, very slender, acute, reflexed or erect; frons distinctly narrowed upwards, abruptly narrower at the base furnished with 2-3 ridges, a little elevated, parallel: vertex very broadly sinuated at the base: thorax barely carinate in the middle: first femora slightly amplified at the apex above; last tibiæ 4-spinose; unarmed above at the base (*Stål*).

39. EUPHRIA AURANTIA, Hope.

Aphana aurantia, Hope, Trans. Linn. Soc. xviii, p. 443, t. 31, f. 2 (1841).
Euphria aurantia, Stål, Stettin Ent. Zeit. xxiv, p. 232 (1863).

Entire body above orange; tegmina sprinkled with barely visible yellow spots, posteriorly spotted black; a few minute spots on the internal margin and a very narrow border on the posterior margin, black: head excavated above, margins elevated; frons produced above the pronotum in a small, tapering, recurved horn: abdomen, at the base, covered with a white powdery substance; body beneath concolorous, a little more obscure (*Hope*). Long 19; exp. teg. 63 millims.

Reported from Assam; the Indian Museum possesses a specimen from Sikkim.

Fresh specimens have the tegmina green instead of orange, sprinkled with whitish powdery spots or patches, more distinct beneath: wings orange, body and abdomen orange yellow, in one specimen inclined to brown; feet (except posterior femora) in some greenish, in others concolorous with the abdomen, recurved horn in some green, in others orange. Also the apices of the tegmina are sometimes faded yellow more or less. A long series should supply the links. The Indian Museum has several specimens from Darjiling.

40. EUPHRIA SUBMACULATA, Westwood.

Aphæna submaculata, Westwood, Duncan's Nat. Lib. i. p. 284 t. 24, f. 1 (1840); Walker, List Hom. B. M. ii, p. 275 (1851).
Aphana resima, Stål, Ofvers. K. V.-A., Förh. p. 190 (1855).
Euphria submaculata, Stål, Stettin Ent. Zeit. xxiv, p. 232) (1863).

Sordid yellow-testaceous; frons with a cephalic protuberance or horn, twice as long as the vertex, channelled above, recurved: lateral margins of thorax narrowly black: scutellum obsoletely tricarinate: tegmina rufous-testaceous above densely spotted whitish-mouldy, costal spots subglaucescent: wings nigro-fuscous, yellow-cinnamon beyond the middle, especially before the middle spotted whitish mouldy: abdomen above whitish-mouldy (*E. resima*, Stål). Body long 21; exp, teg. 71 millims.

Reported from India: the Indian Museum possesses specimens from Sikkim.

41. EUPHRIA LECTISSIMA, Walker.

Aphæna lectissima, Walker, List. Hom. B. M. Suppt. p. 45 (1858).

Grass-green: head with a short, acute, almost vertical horn; sides of the vertex carinate; frons and face flat, the latter with a slight ridge:

abdomen above testaceous: tegmina livid, red beneath, except towards the apex, adorned with many green, white-dotted, spots; border green, adorned with dots of white tomentum along the costa, and with black dots elsewhere, except towards the base of the inferior border where the dots are luteous: wings crimson for more than half the length from the base (*Walker*). Body long, 21: exp. teg. 33 millims.

Reported from N. India: the Indian Museum possesses a specimen from Sikkim. Closely allied to *E. amabilis*, Hope, from which it differs in the absence of the three fulvous spots on the pronotum and of the blackish lines on the mesonotum and posterior margins of the abdominal dorsal segments, and in the spots on the tegmina, which are small and circular, nowhere linear and transverse. Stål (Ofvers. K. V.-A. Förh. p. 486, 1862) unites the two species.

42. EUPHRIA AMABILIS, Hope.

Aphana amabilis, Hope, Trans. Linn. Soc. xix, p. 132, t. 12, f. 1 (1845); Walker, List. Hom. B. M. ii, p. 274 (1851).

Euphria amabilis, Stål, Stettin Ent. Zeit. xxiv, p. 232 (1863).

Body above orange; head green, furnished with an erect, acute, slender horn: prothorax green, marked by three fulvous spots: tegmina cretaceous sprinkled with numerous oval spots; wings coccineous, palely virescent at the apex: body beneath green; feet concolorous; pectus sprinkled over with a whitish down. The spots which above appear to be white and green intermixed are beneath entirely green (*Hope*). Long 25: exp. teg. 69 millims.

Reported from Silhat.

43. EUPHRIA AURORA, Hope.

Aphana aurora, Hope, Trans. Linn. Soc. xix, p. 133, t. 12, f. 2 (1845): Walker, List. Hom. B. M. ii, p. 275 (1851).

Euphria aurora, Stål, Stettin Ent. Zeit. xxiv, p. 232 (1863).

Allied to *E. aurantia*, but smaller; almost the whole body orange: tegmina externally barely virescent, internally orange and sprinkled with very minute whitish spots: body beneath concolorous: wings with cretaceous spots; last tibiæ externally spinose (*Hope*). Body long, 19; exp. teg. 61 millims.

Reported from Silhat, Philippines.

44. EUPHRIA (?) WALKERI, n. sp.

Aphæna dives, var. (?), Walker, List. Hom. B. M. ii, p. 281 (1851).

Body yellowish brown, red beneath: vertex slightly ridged and furrowed: frons rather prominent, furnished with a slender, black, linear furrowed horn which is inclined backward nearly to the posterior margin of the shield: rostrum ferruginous, tip darker, extending nearly to the tip of the abdomen: an excavation partly inclosing the eye on each side lateral margins of pronotum and most of metanotum, black: abdomen a little longer than the thorax, nearly elliptical, red, with a black band across each segment above: legs black, furrowed, femora red, posterior tibiæ spinose: tegmina not much longer than the wings, apex obtuse, pale dingy yellow with very numerous brown marks, reticulated part, yellowish-brown: wings brown with many almost colourless spots which are partly confluent, posterior margin almost colourless, tip pale brown (*Walker*). Body long 14½; exp. teg. 42 millims.

Reported from India.

Genus Phoronis, Stål.

Stettin Ent. Zeit. xxiv, p. 233 (1863).

Head not protuberant but emitting from the base of the frons a very long, very slender, mobile, reflexed process [which in dried specimens is very easily detached]; frons a little narrower above the middle than beneath the middle, abruptly narrowed at the base, furnished with two obtuse, parallel ridges (often obliterated), lateral margins slightly sinuate beneath the middle; vertex truncated at the base: thorax hardly carinate in the middle, first pair of femora distinctly amplified above at the apex: last pair of tibiæ 4-spinose, furnished above at the base with a tubercle (*Stål*).

45. Phoronis nigro-maculata, Guérin.

Aphæna nigro-maculata, Guérin, Icon. Règne An. t. 90, f. 6 (1830-34); Voy. Bélanger Ind. Orient. Zool. p. 457 (1834); Spinola, A. S. E. F. (1 sér.) viii, p. 243 (1839); Walker, List. Hom. B. M. ii, p. 273 (1851).

Fulgora (Aphæna) nigro-maculata, G. R. Gray, Griffith's *ed.* An. King. Ins. ii, p. 260 t. 90, f. 6; t. 138, f. 1 *a-c.* (1832).

Aphana nigro-maculata, Westwood, Trans. Linn. Soc. xviii, p. 149 (1841).

Phoronis nigro-maculata, Stål, Stettin Ent. Zeit. xxiv, p. 233 (1863).

Head and thorax brown; horn black, short, flexible; tegmina brown with some small scattered black spots, exterior margin with a broad black border: wings with basal half silvery grey, spotted with black; other half, black, with the interior margin brownish black; body silvery grey, with transverse narrow bands of black (*Gray*). Head subferruginous, brown; frons with a cylindrical horn recurved backwards; thorax somewhat greenish brown: tegmina obscurely blue, apex finely reticulated with black, punctured with black on the anterior margin with five dots obliquely arranged at the base: wings blue, spotted with black, posteriorly brown, black at the apex: abdomen black, streaked with white: body below and femora ruddy: coxæ brown *(Guérin)*. Long 20; broad 55 millims.

Reported from China, Cochin-China: the Indian Museum possesses a specimen from the Andaman islands with the cephalic process absent.

46. PHORONIS PAULINIA, Signoret.

Aphæna paulinia, Signoret, A. S. E. F. (4 sér.) ii, p. 123; t. 1, f. 6, (1862).

Brick-red with the dorsum, femora, tips of tegmina, tip of the wings and several spots on them of a blackish-brown; on the anterior margin of the tegmina several black spots and a slight filiform, returved cephalic process. Head broader than long, vertex square, a little transverse, with a transverse ridge and a fovea on each side of the eyes: frons convex, without a ridge on the anterior margin, a black filiform appendage, with a longitudinal groove, reaching almost the end of the mesonotum: rostrum of a reddish-brown, reaching the end of the abdomen, the third joint, the longest: pronotum almost five times broader than long, posterior margin concave, anterior convex with a median emargination which gives it a bilobed appearance, presenting on each side, beneath the eyes, a strong emargination: lateral margins convex and black, a slight ridge on the disc: mesonotum weakly tricarinate, and exhibiting towards its extremity two small brown dots. Tegmina with a broad apical band formed of a network of yellow veinlets on a brown ground; on the anterior margin are numbers of black dots, the clavial vein near the fold of the tegmen with 3-5 black dots: wings transparent in the middle, slightly bluish and exhibiting there about a dozen more or less regular brownish spots; tip brownish; the border, also the folded part near the abdomen, slightly infuscate: abdomen red beneath, black above, with the end of the segments and the lateral margins, red; each segment, especially those of the extremity, covered with a thick farinose substance: feet with the tibiæ red and the femora black, the posterior with three strong spines on the external side (*Sign.*) Body long, 16; exp. teg. 50 millims.

Reported from Cochin-China; the Indian Museum has a specimen (with the filiform cephalic process wanting) from Tenasserim. Stål unites this with *P. nigro-maculata*, Guérin, but though structurally the same, the coloration of the tegmina leaves no doubt as to specific identity.

Genus GEBENNA, Stål.

Trans. Ent. Soc. (3 sér.) i, p. 582 (1863); Hem. Afric. iv, p. 135 (1866).

Head broadish, narrower than the thorax, not protuberant; vertex transverse, anterior margin straight, posterior margin broadly sinuate; frons subquadrate, somewhat amplified on both sides at the clypeus, median area amplified upwards, broadly subtruncate at the apex, prominulous before the apical margin of the vertex, not reflexed; clypeus ecarinate: second joint of antennæ transverse, produced upwards from the insertion. Thorax unicarinate in the middle, roundly produced at the apex behind the vertex: scutellum about half longer than the thorax. Tegmina barely amplified towards the apex, rounded at the apex, costal margin straight, longitudinal veins rarely furcate, small transverse veins remotely scattered throughout the entire tegmina: wings remotely transversely veined behind the middle. Feet simple, last tibiæ 4-spinose with their base neither spinose nor tuberculated (*Stål*). Allied to *Aphana*.

47. GEBENNA SYLVIA, Stål.

Gebenna Sylvia, Stål, Trans. Ent. Soc. (3 sér.) i, p. 582 (1863).

Palely grey-flavescent; frons, vertex and disc of thorax and scutellum minutely irrorated black; thorax and scutellum on both sides sprinkled with small black spots: tegmina weakly rufescent-ferruginous from the base beyond the middle, remotely sprinkled black, costal limbus palely olivaceous-virescent; apical part vitreous, sprinkled and spotted fuscous; wings vitreous, palely virescent towards the base, adorned with three irregular, large, subconfluent, black-fuscous spots, before the middle: dorsum of abdomen, black; segments margined olivaceous at the apex; abdomen adorned with four longitudinal rows of irregular grey-flavescent spots; ventral segments on both sides, spotted black, interruptedly banded black at the base: feet with numerous black bands (*Stål*). ♀, long, 13; exp. teg. 39 millims.

Reported from India. Vertex almost thrice as broad as the transverse eye, margins somewhat elevated: frons remotely and finely rugulose, slightly narrowed upwards: thorax less distinctly rugulose: scutellum finely rugulose on the disc.

Genus POLYDICTYA, Guérin.

Icon. Règne Anim. Texte Ins. p. 359 (1830-34); Stål, Hem. Afric. iv. p. 135 (1866).

Vertex about four times as broad as the eyes: entire tegmina densely or very densely reticulated: anterior tibiæ sometimes somewhat dilated: frons obtusely rounded at the base, amplified at the apex and distincly broader than the clypeus, tegmina thrice or more than thrice longer than broad (*Stål*).

48. POLYDICTYA BASALIS, Guérin.

Polydictya basalis, Guérin, Icon. Règne Anim. Texte, Ins. p. 359 (1830-34); Walker, List. Hom. B. M. ii, p. 289 (1851); J. L. S. Zool. x, p. 98 (1867).

Aphæna uniformis, Walker, J. L. S. Zool. i, p. 144 (1857).

Eurybrachys basalis, Hope, Trans. Linn. Soc. xix, p. 134, t. 12, f. 6 (1845); Stål, Ofvers. K. V.-A. Förh. p. 500 (1862).

Fuscous yellow: head flavescent: thorax brunneous; abdomen dull red; tegmina fuscous, reticulated yellow; wings at the base with a cærulean incurved line forwards, posteriorly subroseous; remainder blackish (*Hope*). Body long, 21; exp. teg. 56 millims.

Reported from Sumatra, Silhat. There are at least two apparently undescribed species of this genus in the Indian Museum: one with a double incurved cærulean line at the base of the wings, abdomen vermillion with the dorsal segment more or less banded black, (body long, 16: exp. teg. 46 millims), from the Andamans; and one with the base of the wings red and base of the tegmina above and below with a bluish tinge, (body long, 19: exp. teg. 53 millims), from Sikkim: but a series is desirable before describing them further.

49. POLYDICTYA (?) TRICOLOR, Westwood.

Lystra tricolor, Westwood, Arc. Ent. ii, p. 35, t. 37, f. 4 (1845).
Polydictya tricolor, Walker, List. Hom. B. M. ii, p. 290 (1851).

Sanguineous, very glabrous; anterior lobe of pronotum and mesonotum anteriorly black, basal half of tegmina (the livid base itself excepted) stramineous, spotted black; apical half brunneous; costal spot stramineous: wings red, apical half fuscous: feet chestnut sanguineous (*West.*) Body long, 16½: exp. teg. 56-57 millims.

Reported from Assam.

Genus ANCYRA, White.

A. M. N. H. xv, p. 34 (1845).

Allied to *Eurymela*, Hoff.; but distinguished from it by the shape of the head which has not the dilated genæ, no stemmata, antennæ close under the eyes: tegmina finely veined, with a notch on the posterior margin and rounded at the apex, whence (in ♂) proceeds a longish narrow appendage, widest at the end: legs much dilated and compressed throughout: hind legs very long with four spines on the outer edge of the tibiæ: the end of the body covered with a waxy down-like secretion (*White*).

50. ANCYRA APPENDICULATA, White.

Ancyra appendiculata, White, A. M. N. H. xv, p. 34 (1845); Westwood, Cab. Or. Ent. p. 74, t. 31, f. 5 (1848); Walker, List. Hom. B. M. ii, p. 395 (1851); Distant, J. A. S. xlviii (2), p. 38 (1879).

Rich deep brown: tegmina, above brown, spotted at base with white and with two widish powdery bands of white; beneath, mahogany red: wings deep brown almost black on the edge and between a red-coloured space: body beneath yellow: legs black: wings more powdery in the ♀ than in the ♂ (*White*). Long 9½; exp. teg. excl. appendage 25 millims.

Reported from Maulmain: the Indian Museum possesses a specimen from Tenasserim.

51. ANCYRA HISTRIONICA, Stål.

Ancyra histrionica, Stål, Stettin Ent. Zeit. xxiv, p. 245 (1863).

Fuscous-ferruginous: frons yellow-ferruginous adorned with five subelevated, narrow, black bands: tegmina obscurely ferruginous, basal part and oblique band behind the middle, fuscescent, apical callus black, apical appendage fuscescent-ochraceous: abdomen flavescent (when alive sanguineous ?), apex covered with a mouldy pubescence; feet blackish. Closely allied to preceding; tegmina, especially behind the middle, broader, apical appendage shorter, fuscescent-ochraceous not black-fuscous, apical callus smaller, wings broader and their apical process shorter (*Stål*). ♀, long, 11; exp. teg. 26 millims.

Reported from Cambodia; the Indian Museum has a specimen from Pegu; but the desiccated body is only 8 millims long and the basal part and band behind the middle of the tegmina is lighter dull ferruginous, not fuscescent.

CORRECTION.

C. maculicollis, Guérin, in J. A. S. LIII (II) p. 230, No. 76, is a synonym of *Tibicen brunneus*, Fabr., as follows:—

TIBICEN BRUNNEUS, Fabricius.

Tettigonia brunnea, Fabr., Ent. Syst. Suppt. p. 517 (1798); Syst. Rhyng. p. 43 (1803).

Cicada brunnea, Germar, Thon's Arch. ii (2) p. 6 (1830); Walker, List. Hom. B. M. i, p. 230 (1851).

Cicada maculicollis, Guérin, Voyage la Coquille, Zool. ii, p. 183 (1830): Walker, l. c. Suppt. p. 28 (1858).

T. (Abricta) brunneus, Stål, Hem. Afric. iv, p. 26 (1866).

Ferruginous or testaceous, paler beneath: apex of the scutellum and two very large spots on the thorax, ferruginous-flavescent, the latter with two fuscous streaks: head, a small posterior median spot and a transverse impression on the thorax towards the sides, blackish or fuscescent-ferruginous; a spot on the lobes of the vertex, ferruginous: four triangular spots on the scutellum extended backwards from the base, fuscous; the median pair smaller, often obsolete; the lateral pair produced to a distance backwards: tegmina and wings sordid vitreous, veins testaceous-flavescent, fuscous towards the apex: head a little broader than the anterior part of the thorax: ocelli somewhat more distant from the eyes than from each other: thorax gradually a little narrowed from the apex backwards beyond the middle (*Stål*). ♂, ♀, long, 21—24; exp. teg. 60—73 millims.

Reported from Mauritius, Bengal.

In J. A. S. B. LIV (II) p. 23 *Cosmopsaltria abdulla*, Distant, is recorded as a synonym of *C. spinosa*, Fabr. (l. c. LIII (II), p. 227): the following is Distant's description of *C. abdulla*.

♂. Body above castaneous, more or less covered with greyish pubescence and pilosity: head with the vertex somewhat sparingly pilose and the area of the ocelli, a little infuscate: pronotum sparingly pubescent with a central ×-shaped space denoted by striæ, followed by two oblique striæ, the outer one submarginal and slightly curved, lateral and posterior margins densely pubescent: mesonotum with two faintly indicated obovate spots on the anterior margin, sparingly pubescent, the lateral margins and the region of the cruciform basal elevation much more densely pubescent. Abdomen sparingly pubescent but much more densely so on the disc and the lateral margins: body beneath ochraceous: first and intermediate femora with the bases and apices fuscous, the central portion pale ochraceous; first tibiæ castaneous and tarsi piceous; intermediate tibiæ pale castaneous, with the base narrowly and the apex broadly piceous: last pair of legs pale castaneous, apices of femora, bases and apices of tibiæ, dark castaneous. Tegmina and wings pale hyaline; the former with the costal membrane and basal area. castaneous, claval area, piceous, transverse veins at bases of 2, 3, 5 apical areas infuscate and a submarginal series of small fuscous spots at apices of longitudinal veins: wings with anterior claval margin and a curved basal streak dark castaneous. The face is very swollen and convex beneath, longitudinally furrowed and transversely striated: the rostrum extends just beyond the base of the femora: the opercula reach the base of the fourth abdominal segment; the outer margins are deeply narrowed and concave near the base and then become slightly convex to the apex which is broad and rounded, these opercula are very wide apart at the base and are confined to the lateral side of the under surface of the abdomen (*Dist.*).

XIII.—*Memorandum on the Corrosion of the Lead Linings of Indian Tea Chests.*—*By* Alex. Pedler, F. C. S., *Professor of Chemistry in the Presidency College, Calcutta.*

During the last few years rather numerous instances have happened of chests of tea, apparently prepared and packed in the usual way in the tea districts of India, reaching Calcutta or England in a damaged condition; the damage consisting in the partial corrosion, and sometimes almost total destruction of the lead linings of the chests, and in the deterioration of the quality of the tea itself.

At the request of the Indian Tea Association I undertook some time since to make some experiments in order to ascertain the cause of this corrosion, and though my experiments have not yet been completed so far as I could wish, they are sufficiently far advanced to enable me, at the urgent request of the Indian Tea Association and of the the Bengal Government, to write a preliminary memorandum.

The previously published literature on this subject is remarkably meagre, and it may be summed up in a few words. On the other hand, there is reason to believe that there is a large accumulation of unpublished evidence on this subject, and it is desirable that some steps should be taken to collect and collate the mass of evidence which must have accumulated in the hands of the various agents of tea gardens, and in the hands perhaps of the more experienced planters.

The first experimental enquiry as to the corrosion of the lead linings of Indian tea chests and its cause which I can find published in scientific periodicals appears to have been carried out some time previous to 1883 by Dr. Wigner, who was then President of the Society of Public Analysts in England. He published, in Vol. II of the Journal of the Society of Chemical Industry, a paper entitled "The packing of substances of delicate odour such as Tea, &c."*, in which he describes his experiments, made during the previous five or six years, in certain cases of corrosion of tea-leads in boxes made of Indian woods, the consignments of tea coming principally from Assam. The conclusions at which he arrived were that the corrosion was due to the wood used in the boxes, and his theory, though he did not adduce any specific facts as to the cause of the corrosion, was that the wood must have in some way generated acetic or other volatile acid, which, in the presence of carbonic acid and moist air, would account for the corrosion of the lead. My experiments have in almost all respects confirmed this theory.

The next contribution to our knowledge of this subject which I can find is in a memorandum published by Dr. G. Watt, on special duty with the Revenue and Agricultural Department, Government of India, and dated Simla, June 21st, 1884. Dr. Watt makes the following statement:— "My views on the subject of woods suitable for tea boxes are at variance with the popular outcry against our Indian timbers as injuring the Indian Teas." He also states he has observed the following curious facts:—"The tea may be completely destroyed, and yet upon the most careful scrutiny not a single opening can be detected in the lead. It is obvious that until the lead is corroded any injurious influence which the timber might exert upon the tea could not take place." Again, "I have on several occasions had the pleasure of inspecting lead said to have been corroded by the action of the wood. But it is a curious fact that the action seems to commence on the inside of the lead instead of on the outside or on the surface in contact with the wood, (the supposed acid influence which decomposes the metal) has not been apparently observed." He also suggests "it may be the tea itself which corrodes the metal and not the wood."

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* Journal of the Society of Chemical Industry, Vol. II, p. 256.

Dr. Watt also during the Calcutta International Exhibition had an opportunity of working with 200 tea-box woods from all parts of India, and performed a large series of experiments on the action of these woods on tea-lead. He says both unseasoned and seasoned woods were used in these experiments, which were repeated once or twice, with moistened woods and under conditions intended to simulate those of the hold of a ship, and "in no instance has the lead been found to be in ever so slight a degree chemically acted on;" and finally Dr. Watt states "he failed utterly to discover any wood which seemed to possess the least chemical action upon lead."

In reply to this memorandum, Mr. Playfair, in the Indian Daily News of July 29th, 1884, gave the results of certain investigations on this subject, which had been made for him in London in 1883 by the late Dr. A. Voelcker, F. R. S. Dr. Voelcker's conclusions were that "the corrosion of the lead (in the Indian tea-chests) unquestionably is due to the attack of acetic or other volatile acids, and the subsequent formation of white lead (carbonate of lead) by the action of the air. Considering the fact that the surfaces of the leads which were in contact with the tea were quite bright and sound, whilst the under surfaces in contact with the wood were more or less corroded; it appears to me that in all probability green or unripe wood has been employed in making the tea-chests. Such wood is known to generate in a somewhat warm locality acetic and analogous organic acids which act upon lead."

Dr. Watt, in a long letter, dated August 13th, 1884, also to the Indian Daily News, discusses Dr. Voelcker's conclusions, and to a great extent reiterates the position he had previously taken up. His conclusions may be fairly well summed up in the following statement: "The chest is full of tea which has been fermented, its fermentation arrested rapidly, and the tea is rapidly enclosed in a case and shipped to Europe. Is it improbable that the acetification of the fermented tea may not be the primary agent in the decomposition of the wood and the consequent corrosion of the lead? Having arrived at this conclusion I had little difficulty in producing from tea an acetous organic acid which rapidly corroded lead; so I have no doubt this volatile acid on escaping through the lead lining would soon establish in certain timbers, especially green and unseasoned ones, corresponding acetification, but I am convinced that we have to look to the tea itself and to some imperfection in its manufacture, as the primary exciting agent in the corrosion of the lead and the damage of the commercial article."

In view, then, of these contradictory statements as to the cause of the corrosion of the tea-leads, Dr. Wigner and Dr. Voelcker being of opinion that the cause was the wood, though of course their proof was incomplete, and Dr. Watt holding that the cause was to be found in the tea, I commenced the following experiments.

From a practical point of view the first thing which it was desirable to settle was whether the tea or the wood of the chests was the active agent in inducing the corrosion of the lead. To test this view, certain boxes of tea were specially prepared, and they were then handed over to me by the Indian Tea Association.

Three boxes represent the matter typically.

No. 1 was a half chest containing 40 lbs. of pekoe souchong tea of ordinary manufacture. The half box was made entirely of wild mango wood *(Mangifera Indica)*, damp and unseasoned.

After being kept in the ordinary way for several weeks this box was examined. On being opened the upper surface of the lead next the wood was found to be almost entirely covered with a white powder, which on examination was found to be principally "white lead." The lead was largely corroded over the whole surface, and in fact eaten through in certain places. There were several clear cases of perforation, and, examined under a magnifying glass, the perforations were surrounded on the upper surface with very extensive corrosion. The lead was then cut off from the chest, and the surface next the tea examined; over the greater part it was quite bright and free from corrosion, though in certain parts it was slightly tarnished. The perforations were also examined from the under surface, and there was no trace of corrosion round the edges. Even in this, which should be the most favourable position for corrosion if the corrosion is caused by the tea, no corrosion was seen.

The lead of the bottom of the box and of the four sides was examined, and the results were similar to those above described. On all the external surfaces the lead was largely corroded, and in some parts to a most excessive extent. On the inner side of the lead next to the tea, except on those parts where the lead had been entirely eaten through, the lead was perfectly bright and clean.

The surface of the wood of this chest next to the lead was also found to be distinctly acid to test paper.

The lead having been perforated in this case the corrosion was still open to the possibility of explanation in the manner suggested by Dr. Watt, though, as described above, every appearance was against it. To test this point the following experiments were made:

Pieces of the slightly moistened wood were placed with tea-lead in a large bottle with air charged with moist carbonic acid, but, after standing for some time, practically no corrosion of the lead appeared.

Some of the tea was taken under similar circumstances to the above and placed with tea lead; the lead remained perfectly bright and uncorroded.

Some of the wood of the box was distilled in a current of steam, and the distillate tested by placing some of it at the bottom of a bottle; a piece of tea-lead was then hung in the bottle, so that it did not touch the liquid, and the bottle was repeatedly filled with air charged with moist carbonic acid.* The tea-lead was very distinctly corroded on standing.

Some of the tea was also distilled in a current of steam and the distillate treated as in the last experiment, but it had no corrosive action whatever on the tea-lead. Some pieces of the wood of this box were placed with water and tea-lead hung over it, but not so as to touch it, and exposed to the air. The lead was corroded very rapidly. Some of the tea was taken also placed in water and tea-lead hung over it, but not so as to touch it. For a long period there was no corrosion of the tea-lead, but after the tea had become mouldy and had decomposed for some time, then corrosion set in, but very much later than in the previous experiment with the wood.

It was highly probable, then, from these experiments that the wood was the source of the corrosion and certainly not the tea.

Examination of Case No. 2. This was a half chest containing 40lbs. of pekoe souchong tea, and made entirely of wild mango wood, which was thoroughly dry and well-seasoned, but after the tea was packed in the box, one side, marked "B," was well damped with fresh water and the other sides left untouched.

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* The presence of the carbonic acid and moist air is a necessary condition to produce rapid action on lead in the presence of certain exciting agents. It is also the the condition which a chest of tea would probably be subjected to in the hold of a ship.

This chest was again kept for several weeks under ordinary circumstances, and was then examined. Five of the outer sides of the lead lining were quite free from corrosion, but the sixth surface, opposite to the plank marked B, showed very evident corrosion, and considerable amounts of lead carbonate or "white lead," were present over almost the whole surface. This side of the lead lining was examined minutely, and there was no perforation of any kind visible.

The inner side of the lead lining was also examined and the whole of the interior was perfectly bright and free from all tarnishing and corrosion. The inner side of the corroded part was examined most carefully, but not the slightest evidence of any action could be detected, nor were there any perforations on this side of the lead.

The wood (seasoned) of this box and also the tea were allowed to remain in contact with moist air containing carbonic acid for many weeks, but no corrosion took place.

In this case, as there was no perforation of the lead on the side on which the lead was corroded on the external surface, Dr. Watt's explanation cannot possibly apply, and the only logical conclusion is that the corrosion was due to the wood. This time also it will be seen the corrosion was brought about not by unseasoned wood, but by seasoned wood which had been subsequently intentionally thoroughly saturated with water.

Examination of Case No. 3. This was a half chest containing 40lbs. of pekoe souchong tea manufactured in the ordinary way, and the box was made entirely of wild mango wood, but partly seasoned and partly damp and unseasoned. The pieces of wood marked A were the damp and unseasoned wood of the box. The unmarked planks were of seasoned wood.

For examination, the tea in its lead lining was removed from the wooden box, and the lead lining presented a very curious appearance. The following is a description of it.

Side No. 1. The lead lining under the upper or broad plank showed no corrosion: this plank was not marked. The lead lining under the narrow plank, which was the lower piece and was marked A, showed much corrosion. Side No. 2. Under broad unmarked plank practically no corrosion, under narrow plank (marked A) much corrosion. Side No. 3. Under large unmarked plank no corrosion and under small or narrow plank (marked A) much corrosion. Side No. 4. Under broad unmarked plank no corrosion. Top of box under broad unmarked plank no corrosion, and under narrow plank (marked A) much corrosion. Bottom of box. The greater part of the bottom lead was practically free from corrosion, but at its edges it showed marked evidence of corrosion, particularly near two sides of box where there were pieces of wood marked A.

The lead lining was very carefully examined, and, though the lead was much corroded in parts, it showed no sign of perforation by the corrosive action.

The interior of the lead lining was examined and it showed no signs of tarnishing or corrosion or any action whatever.

This tea was again allowed to remain in contact with tea-lead for many weeks in a moist atmosphere containing carbonic acid, and absolutely no corrosion took place.

Here, again, as there was no perforation of the lead lining, Dr. Watt's explanation is untenable, and the corrosion was solely due to the use of unseasoned wood.

Two other cases of lead corrosion were drawn to my attention, and though I regret I was unable to obtain the name of the wood of which the tea boxes were made, the results of the examination are interesting.

A case of tea marked S. (No. 1.) on being opened was found to have its lead lining corroded, but not to a very great extent. The corrosion in this case was of totally different nature from that in the above cases, and thus while in ordinary cases the corrosion was white and to a certain extent pulverulent, in the case in question the incrustation was greenish-yellow in colour, and firmly adherent to the lead. The wood of the box judged externally seemed well-seasoned, but on being splintered emitted a "cheesy" odour, which flavour, I was told, had communicated itself to the tea. The wood was examined and the odour appeared to be due principally to a minute quantity of butyric acid which was present.

This wood was subjected to distillation in a current of steam, the distillate placed in a bottle with tea lead hanging over it, and the bottle was filled with moist carbonic acid; on standing one side of the lead became dull and tarnished, showing faint action or corrosion.

Another chest of tea marked S. 2. showed presently similar damage, and the wood again though apparently good and seasoned on the outside, when splintered gave off a very rank and offensive smell. This apparently was also due to a great extent to the presence of butyric acid.

The wood of S. 2. was distilled in a current of steam, and the distillate placed in a bottle with tea lead hanging over it, though not touching it, and treated with air containing moist carbonic acid, and after a short time the lead showed distinct, though not a large amount of corrosion.

These two cases are principally interesting because they show that more than one agent may sometimes be at work in this corroding action, for the results of the action in this case are markedly different from the general corroding action found in the other cases.

Six other small boxes of tea made of different kinds of wood were also examined. These boxes were made I believe of wood after seasoning in the ordinary way. They were also handed over to me by the Indian Tea Association.

No. 1. Box made of simal* wood and kept in a damp atmosphere for many weeks. The lead lining was free from corrosion both on the surface next to the wood and also on that next to the tea.

No. 2. Box made of jokee† wood and kept in a damp atmosphere for many weeks. The lead lining was free from corrosion both on the surface next to the wood and also on that next to the tea.

No. 3. Box made of kudum‡ wood and kept in a damp atmosphere for many weeks. The lead lining was free from corrosion both on the surface next to the wood and also on that next to the tea.

No. 4. Box made of ahm § wood and kept in a damp atmosphere for many weeks. The lead lining was free from corrosion both on the surface next to the wood and also on that next to the tea.

No. 5. Box made of jowah‖ wood and kept in a damp atmosphere for many weeks. The lead lining was free from corrosion both on the surface next to the wood and also on that next to the tea.

No. 6. Box made of seeta¶ wood and kept in a damp atmosphere for many weeks. The lead lining was free from corrosion except on one side where there was a faint trace of a white powder on the surface next to the wood, but next to the tea, the surface of the lead lining was absolutely bright. There was again no perforation.

The woods of boxes Nos. 1 to 4, and also the tea which was contained in them, were exposed in contact with some tea lead in the damp atmosphere of a chemical laboratory for many weeks, and in this atmosphere there would be large quantities of carbonic acid and also vapours of various other acids, but no corrosion of the lead was set up, by the action either of the wood or of the tea in the boxes.

Taking then the general results of the foregoing work, it may be said the experiments prove conclusively that the active agent in the corrosion of the lead linings of these tea chests was certainly not produced from the tea which was contained in the chests, but from the wood of which they were formed.

It will also have been noticed that the corrosion was never produced when the wood of the box was in a *thoroughly seasoned and dry* condition, but that in every case where unseasoned wood was used corrosion of the lead was the invariable result. Again, in one instance it is shown that even where seasoned wood was used, if it be afterwards thoroughly saturated with water, it again becomes capable of producing corrosion of tea-lead, though perhaps not so violently as wood in the unseasonsd state.

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* Probably wood of *Bombax malabaricum.*

† Probably wood of *Bischoffia javanica.*

‡ Probably wood of *Anthocephalus cadamba.*

§ *Mangifera indica.*

‖ Probably wood of *Helicia robusta.*

¶ Probably wood of *Anona squamosa.*

It therefore became desirable to determine whether this power of corrosion of tea leads was a property common to unseasoned woods in general, or whether it was only an isolated action due to the use of the wild mango wood, and for this purpose the following ten (10) samples of wood were experimented with. These samples were also prepared and handed over to me by the Indian Tea Association, and I believe they represent wood which may be commonly used for tea boxes.

The following was the method of procedure. Pairs of planks of the various kinds of wood were prepared about 3 feet long by 8 inches wide. Between each pair a sheet of tea lead was placed and the planks well screwed together. The planks with the tea lead were then exposed to a moist atmosphere for many weeks. The following are the names of the woods and their condition.

1st Pair. Wild mango wood, damp and unseasoned, the wood of the *Mangifera indica.*

2nd Pair. Wild mango wood, dry and well-seasoned. Wood of the *Mangifera indica.*

3rd Pair. Wild mango wood, dry and well-seasoned, but after these pieces were screwed together, one of them (marked C) was well damped with fresh water and the other left untouched. Wood of the *Mangifera indica.*

4th Pair. Dumboil wood, damp and unseasoned; perhaps the *Calophyllum inophyllum.*

5th Pair. Jalna wood, damp and unseasoned (ahm-jalna).

6th Pair. Tulla wood, damp and unseasoned, perhaps wood of the *Sterculia alata.*

7th Pair. Sita wood, damp and unseasoned, probably wood of *Anona squamosa.*

8th Pair. Satrang wood, damp and unseasoned.

9th Pair. Bolos wood, damp and unseasoned, probably wood of *Juglans plerococea.*

10th Pair. Alodsake wood, damp and unseasoned.

The following is the description of the condition of the leads on examination.

No. 1. Both surfaces of lead very largely corroded, and a very considerable part of the lead entirely converted into white lead.

No. 2. One side of the lead quite bright and free from corrosion, and the other side covered with a fungus growth, which on removal showed the lead surface bright and uncorroded.

No. 3. The upper plank marked C was discoloured. (This was the plank which had been saturated with fresh water.) The lead surface next to this plank was partly covered with vegetable growth, and there was also a moderate amount of corrosion, "white lead" being present in considerable quantity.

The lower plank (seasoned wood *not* moistened with water) was clean, and the surface of the lead in contact with it was quite clean and free from all trace of corrosion.

No. 4. Both surfaces of lead were covered with vegetable or fungoid growth. The amount of corrosion seen on removing the vegetable growth did not appear to be large, but considerable quantities of white lead were found with the fungoid growth

No. 5. The greater part of the lead was corroded and eaten entirely through, and almost the whole of the lead was converted into white lead or carbonate of lead.

No. 6. Both sides of lead were covered with vegetable growth. In certain parts of the lead there had been considerable corrosion, and a moderate amount of white lead was present.

No. 7. On both sides of the lead there was a large amount of fungoid growth and also of corrosion of the lead, much carbonate of lead was present, and in two places the lead was entirely eaten through.

No. 8. Parts of the wood had almost entirely decayed away or rotted, and the wood was an extremely soft one Under the surface of the wood which had decayed, the lead was covered with vegetable growth and much corroded, but on the other surface of the lead, next to the wood which had not decayed, the greater part was quite clean and bright, and only a small amount of corrosion was detected.

No 9. Both sides of the lead were much corroded.

No. 10 On the upper surface of the lead there was a moderate amount of vegetable growth, and a small amount of corrosion, and on the lower side of the lead there was a large amount of vegetable growth and a moderate amount of corrosion.

The results of the first three experiments in the above sets of wood strikingly confirm the results of the previous experiments with the tea chests, and it will be seen that unseasoned mango wood attacks lead in a moist atmosphere rather violently, also that seasoned mango wood kept dry has no action on it, but that seasoned mango wood, if it is subsequently saturated with water, becomes again in a condition in which it is able to attack lead in the presence of a moist atmosphere, though not so violently as is the case with the unseasoned wood. Of the other seven varieties of wood, all of them in a damp and unseasoned condition, every sample corroded the lead in a moist atmosphere, some woods corroding the lead very largely and others to a smaller extent.

In order to test further the action of these woods on tea-lead each of them was distilled in a current of steam to get off any volatile substance present or produced by the action of water. The distillates were then taken, a portion of each placed in large bottles with tea lead hanging over the liquid, and the bottles filled repeatedly with moist air containing carbonic acid.

No. 1 distillate had a very musty and unpleasant odour, and had only an excessively faint acid re-action. It was treated as above when the lead was somewhat corroded at the bottom of the slip, and lead carbonate was found to be present in small quantity.

No. 2 distillate also had a very musty unpleasant odour, and the watery layer was very faintly acid. The lead surface was slightly dulled, but no actual corrosion was perceptible.

No. 3 distillate had also a musty unpleasant odour, the liquid was almost neutral in re-action. The surface of the lead was very distinctly corroded, and a small amount of lead carbonate was found.

No. 4 distillate had a musty unpleasant odour, and the liquid was faintly acid. The surface of the lead was slightly dull, and very faint traces of corrosion were found.

No. 5 distillate had a musty unpleasant odour, and the watery solution was faintly acid. The surface of the lead was slightly dull, and there was slight corrosion at a few points. Lead carbonate was present.

No. 6 distillate had a musty unpleasant odour, and the solution was faintly acid. The surface of the lead was decidedly dull and whitish, though there was only slight corrosion.

No. 7 distillate had a musty and unpleasant odour, and the liquid was certainly not acid, but distinctly alkaline. The surface of the lead was practically unacted upon.

No. 8 distillate had a slight ethereal smell but also a musty unpleasant odour; the liquid was alkaline. The lead surface was almost bright and there was practically no corrosion.

No. 9 distillate had a musty unpleasant odour, and the liquid was distinctly alkaline. The lead surface was almost bright, and there was practically no corrosion.

No. 10 distillate had a musty unpleasant odour and the liquid was almost neutral. The surface of the lead was distinctly tarnished, and a small amount of corrosion was visible; small amounts of lead carbonate were present.

The action of these woods on lead was tested in another way by macerating samples of the splintered wood in water, evaporating till a fairly concentrated extract of the soluble principles of the wood was obtained, and then painting the surface of some tea-lead with the extract, and exposing the lead so prepared to the action of moist carbonic acid and air.

No. 1	sample.	The lead scarcely acted on.
No. 2	,,	,, ,, ,, ,, ,,
No. 3	,,	,, ,, ,, ,, ,,
No. 4	,,	A small amount of lead carbonate formed.
No. 5	,,	Slight amount of lead carbonate formed.
No. 6	,,	,, ,, ,, ,, ,, ,,
No. 7	,,	Practically no action on the lead.
No. 8	,,	,, ,, ,, ,, ,, ,,
No. 9	,,	Slight amount of lead carbonate formed.
No. 10	,,	,, ,, ,, ,, ,, ,,

The amount of action in this set of ten experiments, and also in the previous set of ten experiments with the distillates in steam of these woods, was in all cases comparatively slight, and it was not to be compared in extent or in nature, to the action which the same woods had produced originally on the tea-leads which had been packed between them; and the conclusion which naturally suggests itself from this is, that the cause of corrosion does not pre-exist in the wood in the condition of a volatile substance, and that it is not present to any large extent in the solution obtained by extracting the wood with water.

Taking these results then in connection with those previously detailed, it is clear that the corroding substance, whatever it may be, must be formed gradually in the wood, and that the formation is connected with the continued presence of moisture, or with the wood being in a damp and unseasoned state, and also that the active agent in the corrosion is a volatile body.

The next step in the investigation of the subject is clearly to trace out the active agents which induce the corrosion of the tea-lead, and, in order to do this, I thought it desirable to observe the action of tea-lead when placed in contact with vapours of various classes of substances which might induce corrosion, or which under certain circumstances might be produced from wood, and in the presence of moist air and carbonic acid also induce corrosion. My reason of course for working only with the vapours of these substances was that in all the cases of corrosion I had examined there were always parts of the corroded lead which were not in actual contact with the wood, and which therefore could only have been corroded by the agency of some vapourous body, and also that the active agent of the corrosion was volatile in a current of steam in almost all cases.

Lead is a metal which, it is well known, is easily corroded by certain substances, and the most important case is the action which is employed on an enormous scale in the manufacture of white lead or carbonate of lead by the Dutch process. In this process sheets of lead rolled up in spiral form are exposed in earthenware vessels, which contain a very small quantity of acetic acid or vinegar; these vessels are then stacked together and surrounded by decomposing tan or other organic material, which on standing under the influence of moisture, heats and evolves carbonic acid. The quantity of acetic acid used in such operations is very small, less, I believe, than one per cent. of the lead operated upon, and yet the lead under the influence of this minute quantity of acetic acid, and in the presence of moist air and carbonic acid at a slightly elevated temperature, is very rapidly corroded, and finally becomes almost entirely converted into white lead, which, as is well known, consists of carbonate mixed with hydrate of lead, and which, as produced in the first instance, contains minute quantities of lead acetate adhering to it, the acetate being afterwards removed by washing with water before the article is sent into commerce.

The first series of bodies the action of which I tried on tea lead, was the group of organic substances to which acetic acid belongs. In organic chemistry there is a large group of fatty acids as they are called, of which acetic acid stands next to the lowest, and which acids possess a precisely similar constitution, and act usually in precisely similar ways. These acids are homologous, only differing in composition by a well known increment of carbon and hydrogen. The lowest members only of this series are volatile, and I experimented with the five lowest with the following results. The mode of experiment was simple: a drop or two of the acid was placed at the bottom of a large bottle, a strip of tea lead was then hung in it, but not so as to touch the acid and the bottle filled with moist carbonic acid and air, the carbonic acid being renewed from day to day, or at frequent intervals as seemed necessary. The action then could only take place between the lead and the vapour of the acid, and the carbonic acid and moist air.

The first or lowest member of this series is Formic acid, and under its action the lead surface became dull and corroded to a small extent. There was a grey coherent film adhering to the lead and little or no white incrustation. The film on examination appeared to be Lead formate, and it is therefore evident that formic acid does not act on lead in the same way that acetic acid does.

Acetic acid in very small quantity was tested in the same way; the lead in a few hours was entirely covered with a film of white lead; in twenty-four hours the greater part of the lead had been corroded and destroyed, and in thirty-six hours the lead had been entirely eaten through, and converted into white lead with a small quantity of lead acetate present in it as usual.

Propionic acid, the third member of the series, after a few days had corroded the lead rather rapidly,' and the greater part of the lead was entirely eaten through. The greater part of the lead was converted into the carbonate, though some soluble propionate was found.

Propionic acid then acts on lead in a manner analogous to acetic acid.

Butyric acid was tried in a similar manner, and after standing some days the lead was more than half eaten through, and the surface was covered with a moist yellowish green deposit. The lead was to a considerable extent converted into lead butyrate, but lead carbonate was also present in small quantity. Butyric acid therefore acts on lead in a manner analogous to acetic and propionic acid, but far more feebly.

Valeric acid, the fifth and last member of this series tried, caused a large amount of action on the lead, the surface of which became covered with a greenish yellow incrustation, and on some parts of which considerable amounts of crystalline scales were present. A large part of the corrosion was due to the formation of lead valerate, but a small amount of carbonate was also present.

Valeric acid therefore acts on lead in the same way as acetic, propionic, and butyric acid, but the production of the carbonate is much more feeble.

A most interesting point in the case of the last two bodies, butyric and valeric acids, is that the incrustation on the lead was strikingly analogous to that found in the rarer form of corrosion in tea chests as described under the cases S. 1. and S. 2.

Other but less volatile organic acids, such as Benzoic acid etc., were tried, but they produced no appreciable action on lead.

Hydrochloric acid in the same way was tried and the lead surface became covered with chloride of lead with which a minute trace of carbonate was mixed.

Nitric acid tested in the same way caused very rapid corrosion, the product of the action appearing to be either a basic nitrate or a mixture of nitrate and hydrate.

Ammonia acted on the surface of the lead to a small extent, and converted it partly into oxide.

A series of alcohols, consisting of methylated ethyl alcohol, ethyl alcohol, propyl alcohol, butyl alcohol and amyl alcohol, was tried, but beyond a slight superficial action no corrosion was found to take place.

A series of essential oils was then tried, including oils of anise, bergamot, cinnamon, cloves, eucalyptus, lemon, peppermint, and turpentine, and also camphor, menthol, and thymol. In almost all the cases of the oils, slight corrosion of the lead into oxide and carbonate was found. It was therefore clear that these oils facilitate the action of moist carbonic acid and air on lead. In no case however had the corrosion proceeded to any large extent, and it consisted only of a kind of white film or bloom on the surface of the lead, such as is frequently seen in tea chests when there appears to have been a tendency to action, though no actual corrosion. In the case of camphor, menthol and thymol the lead was perfectly unacted upon.

Other tests have been made, but they need not be here described, and so far as my experiments have gone they indicate that the only class of organic substances which is capable of producing rapid chemical action on tea-lead in the presence of moist air and carbonic acid is the class of fatty acids or the acetic series of acids. Of these formic acid does not produce any carbonate of lead; the action of acetic acid, as is well known, is violent; that of propionic acid is of similar nature but less violent: the principal products of the action being in these two cases white lead; and finally butyric and valeric acids produce yellowish green incrustations on lead which contain only small quantities of carbonate.

The next point which I have endeavoured to work out is to trace the actual active agent which induced the corrosion in some of the cases described in the first part of the paper, and for this purpose a more minute investigation was made into the products of the corrosion of the leads. Four of the leads which had been much corroded in the ten samples which had been placed between boards were taken. The numbers selected were No. 1. Wild mango wood, No. 4. Dumboil wood, No. 5. Julna wood, and No. 8. Sita wood.

In the corroded lead of No. 1., the material was principally lead carbonate and lead hydrate; acetic acid was also distinctly detected by several tests, so that the active agent in the corrosion of this lead was clearly acetic acid. In the corroded lead of No. 4., the material was again principally lead carbonate and hydrate; acetic acid was also clearly detected, but the quantity present was very minute. In the corroded lead of No. 5, again, the corroded material was mainly lead carbonate and lead hydrate; acetic acid was tested for and detected with great ease, and the quantity was comparatively large, sufficiently large to convert the acid into barium acetate, which presented the usual properties, but the quantity was not large enough for a quantitative analysis. In the corroded lead of No. 8, the principal material was lead carbonate and hydrate, but the presence of acetic acid was also clearly detected.

Evidently then the action which has taken place in the case of these woods in contact with the tea-lead has been identical with that previously described as the Dutch method of making white lead. Acetic acid was present in minute quantity, moist air and carbonic acid have also been present at a comparatively high temperature, and thus all the conditions were favourable for the production of white lead.

The conclusion, then, at which I arrived was that the corrosion was produced by the unseasoned, or moistened wood, and that acetic acid was the active agent in the corrosion. In order to further test the point, I made extracts from the various samples of wood numbered 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10, and distilled these extracts with dilute sulphuric acid. In all cases a distillate of distinctly acid and acetous smell was obtained, evidently showing the presence of small quantities of acetic or some analogous acid in combination in these woods.

The final point which then remains to be cleared up is the origin of the acetic acid from the wood, for, as previously pointed out, it evidently does not exist in the first instance ready formed in the wood, but is produced by some secondary action. Dr. Wiguer in the publication previously referred to put forward a very probable theory. He remarks "The sap of wood invariably contains sugar. The quantity is small, but still measurable. This sugar is in every case, which has come under my knowledge, a fermentable sugar, and the first result of the fermentation is in most cases alcohol. Fermentation being carried a step further free acetic acid is the natural result. With the formation of acetic acid carbonic acid is also formed ... Transferring this from a theoretical to a practical case: A wood containing sap which was more than usually saturated with sugar, and exposed to a moist heat, would ferment more readily, would produce a larger quantity of alcohol, would consequently produce a larger quantity of acetic acid, and would therefore, by inference, derived from practical work, produce a larger amount of carbonic acid, and thence of white lead. These effects would be produced mainly, if not entirely, upon the surface of the wood, and one of these surfaces would be in contact with the metallic lead which forms the lining of the case. Now let us see what would take place. The lead lining would be exactly in the same condition as the lead in a leadstack which was being worked by the Dutch process. Acetic acid, carbonic acid, and moisture would all be present. There would be a reasonable and probably, in accordance with practice, a very proper degree of heat, and the lead and wood would be in contact; and it seems the most natural thing in the world to assume that, as the result, acetate of lead would be formed by the direct action of the acetic acid. Carbonate and hydrate of lead would be formed from this by the action of the carbonic acid and the moisture in the air, and although the two chemical changes would run on almost concurrently, yet the result would be the direct formation of a film of white lead."

The samples of wood Nos. 1 to 10 were therefore tested to see whether any fermentable sugar could be detected in them. It must, however, be remembered that these woods had already produced their corrosion, and according to the above theory a part, if not the whole, of the fermentable sugar contained in the wood would have disappeared in the process. Of the ten samples No. 1 wild mango wood was tested most carefully, and very distinct indications of a fermentable sugar were obtained. No. 5 jalna wood and No. 9 bolos wood also gave clear indications of fermentable sugar, and in the case of Nos. 2, 3, and 8 as well, there appeared to be traces of this substance, but in Nos. 4, 6, 7, and 10, I could not detect any indications of fermentable sugar at all.

The presence of fermentable sugar in small quantity in the wood is certainly a probable cause of the formation of acetic acid, but wood contains other ingredients besides. Thus, for instance, some kind of starchy matter is a nearly constant ingredient of the stems of trees, and forms the chief bulk of the reserve matter out of which leaves and shoots are produced in spring. The presence of starch is also in some way connected with the presence of sugar, for experiments have proved clearly the existence of varying amounts of sugar in fruit trees, and also that the sugar reaches its maximum in the spring when the starch is undergoing solution. Starch also in the condition in which it is found in unseasoned wood under the continued influence of heat and moisture will undoubtedly suffer decomposition, and the products of decomposing starch, as is well known, are of a decidedly acid character, and of the acids formed, some are of the acetic series, and of these butyric acid may be recognized.

The sap of woods has also been investigated and one of the principal constituents is sugar. Of the presence of carbo-hydrates other than sugar no definite evidence exists, but in the cases which have yet been investigated malic acid was also present in the sap. Now malic acid is a substance on which the action of putrefactive ferments has been tried, and the products of the fermentation are carbonic acid, acetic acid, succinic acid, and butyric acid.

I regret that up to the present time I have not been able to investigate the sap of any Indian trees, nor have I found malic acid in the woods experimented on, but given the probable, if not the almost certain presence of small quantities of malic acid in the sap, and given the conditions of heat, moisture, etc. to set up putrifactive fermentation in the moist and unseasoned wood, the presence of all the substances necessary to corrode tea-lead will at once follow.

In the case of an unseasoned wood, the sap will still be present in small quantity, and thus the presence of acetic acid, butyric acid, etc., may be readily accounted for, if the wood is placed under circumstances of heat and moisture favourable to the production of fermentation.

The conclusions that my experiments have led me to form are as follows :—

1. That tea properly manufactured in the ordinary way has no power to corrode lead.

2. That if unseasoned and damp wood is used for the manufacture of the tea boxes, corrosion of the tea lead is, under favourable circumstances, almost certain, but that some varieties of wood act more violently than others.

3. That even if seasoned wood be used to make the tea boxes, and if it be allowed to become saturated with water, and then placed in favourable circumstances of heat and moisture, corrosion of the tea lead may occur, though not to so great an extent as if unseasoned wood had been used.

4. That the active agent does not exist ready formed in unseasoned wood, but is produced by a secondary action from the constituents of the wood.

5. That the corrosion is not usually due to contact action between the lead and the wood, but that a volatile substance is gradually produced from the unseasoned wood.

6. That the corroding agent is usually acetic acid in the presence of moist air and carbonic acid, but that other acids of the same series are sometimes produced, and also act on the lead, and in the case of butyric and valeric acids a greenish yellow incrustation is formed differing entirely from the whitish or yellowish incrustation produced from acetic acid.

7. That the acetic and other acids are produced by the decomposition (probably by a kind of fermentation under the influence of heat and moisture, and perhaps started by decomposing nitrogenous matters) of certain substances which are known to be present in woods. Such bodies are fermentable sugars, starchy matters, malic acid, etc.

8. That the lead linings of the tea chests having been corroded and perforated by the corroding action of these acids in the presence of moist air and carbonic acid, the tea can easily take up the disagreeable odour which the wood itself will possess, after it has undergone the change in which acetic and butyric acid, etc., are formed, and thus the quality of the tea will be deteriorated.

XIV.—*Indian Ants of the Indian Museum, Calcutta.*—*By* PROFESSOR AUGUST FOREL, *Zurich. Communicated by the* NATURAL HISTORY SECRETARY.

[Received Nov. 13th;—Read Dec. 2nd, 1885.]

Family FORMICIDÆ.

I. Subfamily **Camponotidæ.**

Forel, Zeitschr. f. wiss. Zool. xxx, Suppl. 1878.

Genus CAMPONOTUS.

Mayr, Europ. Formic. 1861.

1. CAMPONOTUS SYLVATICUS, Olivier (Encyclop. Méth. Hist. Nat. VI).

Subspecies *C. cognatus*, Smith (Cat. Brit. Mus. 1858), var. *e*, Mayr (Ants of Turkestan coll. b. Fedtschenko), ☿ and ♂.*

The *Camponotus sylvaticus* is a large species, which is divided into many subspecies and varieties, and which occurs throughout the world. The subspecies *cognatus*, var. *e*, inhabits Africa and South Asia.

2. CAMPONOTUS MICANS, Nylander (Annal. d. Sc. Nat. IV), ☿.

This species is found in Europe, Africa, and India.

3. CAMPONOTUS OPACIVENTRIS, Mayr (Verhandl. k. k. zool.-bot. Ges. Wien, 1878), ☿.

Species very closely allied to the *C. sericeus*, Fabr.

4. CAMPONOTUS IRRITANS, Smith (Catal. Brit. Mus. 1858 (= *Camp. inconspicuus*, Mayr, Ann. Mus. Civ. Genova, 1872), ☿.

Genus POLYRHACHIS.

Shuckard, Hist. of Insects.

5. POLYRHACHIS LÆVISSIMA, Smith (Catal. Brit. Mus. 1858) (= *Polyrhachis globularia*, Mayr, Tijdschrift voor Entomologie 1867), ☿.

Genus PRENOLEPIS.

Mayr, Europ. Formic. 1861.

6. PRENOLEPIS LONGICORNIS, Latr. (Hist. Nat. Fourmis, 1802), ☿.

A cosmopolitan species.

Genus ŒCOPHYLLA.

Smith, Proc. Lin. Soc. Zool. 1860.

7. ŒCOPHYLLA SMARAGDINA, Fabr. (Spec. Ins. I) (= *Formica virescens*, Fabr., Syst. Ent. 392 = *Formica longipes*, Jordon, Madras Journal Lit. & Sc. 1851), ☿.

This species is also found of a green colour.

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* ☿ is the sign for "worker"; ♀, for "female"; ♂, for "male"; and ♃, for "soldier."

Genus ACANTHOLEPIS.

Mayr, Europ. Formic. 1861.

8. ACANTHOLEPIS FRAUENFELDI, Mayr (Form. Austr. 1851), ☿.

This species has been hitherto known only from the Mediterranean country, Aden, Turkestan, and Persia. The specimens from Calcutta would belong to the variety *bipartita*, Smith (Proc. Lin. Soc. Zool. 1861); but the body is of a dark brown-blackish colour. They are large (3 millims.) and opaque.

The mesothorax of this genus is much narrowed in the middle, like the waist of a slender lady.

II. Subfamily **Dolichoderidæ.**

Forel, Zeitschr. f. wiss. Zool. xxx, Suppl. 1878.

No representative of this subfamily was among the ants sent from Calcutta.

III. Subfamily **Poneridæ.**

Smith, Cat. Brit. Hym. 1851.

Genus PONERA.

Latreille, Gen. Crust. et Ins. 1806-1809.

9. PONERA TESSERINODA, Mayr (Verhandl. k. k. zool.-bot. Ges. Wien, 1878, *nec* Emery, Ann. Mus. Civ. Genov. IX, 1876-77), ☿.

10. PONERA LUTEIPES, Mayr (Myrmecol. Studien, 1862), ☿.

Genus DIACAMMA.

Mayr, Myrmec. Studien, 1862.

11. DIACAMMA VAGANS, Smith (Journ. Linn. Soc. Zool. V, 1860, Roger (Berl. ent. Zeitschr. 1860, p. 304), ☿.

Genus LOBOPELTA.

Mayr, Myrmec. Studien, 1862.

12. LOBOPELTA CHINENSIS, Mayr (Neue Formiciden, 1870), ☿.

The specimen from Calcutta is only 8.5 millims. in length. Mayr's specimens were larger (9. 5—10 millims.).

13. LOBOPELTA KITTELI, Mayr (Neue Formiciden, 1870), ☿.

IV. Subfamily **Dorylidæ.**

Shuckard, Ann. of Nat. Hist. v, 1840.

Genus TYPHLOPONE.

Westwood, Introd. Class. Ins. 1840.

14. TYPHLOPONE ORANIENSIS, Lucas (Expl. de l'Algérie, 1840-42), ☿.

This species has been hitherto known only from Northern Africa and from Asiatic Turkey. The specimens from Calcutta are quite identical with specimens from Algeria and Palestina in my collection.

V. Subfamily **Myrmicidæ.**

Smith, Cat. Brit. Hym. 1851.

Genus SIMA.

Roger, Berl. ent. Zeitschr. 1863 = *Eciton* Jerdon, *nec* Latreille.

15. SIMA RUFO-NIGRA, Jerdon (Madras Journ. Lit. & Sc. 1851, *Eciton*), ☿.

16. SIMA COMPRESSA, Roger (Berl. ent. Zeitschr. 1863 ?), ☿.

The only specimen from Calcutta is very large (7. 5 millims.) The specimens which were described by Roger (l. c.) and Mayr (Tijdschr. voor Entomol. 1867) measured only 4—5 millims. Therefore the identity of our specimen with *S. compressa* does not seem to me to be perfectly sure, though the other characters agree with the description.

Genus MYRMICARIA.

Saunders, Trans. Ent. Soc. Lond. 1841-43 = *Heptacondylus* and *Physatta*, Smith.

17. MYRMICARIA SUBCARINATA, Smith (Cat. Brit. Mus. 1858, *Heptacondylus*), ☿.

Genus HOLCOMYRMEX.

Mayr, Verh. k. k. zool.-bot. Ges. Wien, 1878.

18. HOLCOMYRMEX SCABRICEPS, Mayr (Verh. k. k. zool.-bot. Ges. Wien 1878), ☿ major and ☿ minor.

Genus PHEIDOLE.

Westwood, Ann. & Mag. Nat. Hist. vi, 1841 = *Ocodoma*, Jerdon, l. c.

19. PHEIDOLE INDICA, Mayr (Verh. k. k. zool.-bot. Ges. Wien 1878), ☿, ♃, and ♀.

The specimens are smaller than Mayr's. I have submitted this ant to Prof. Mayr, who has pronounced it to be his *P. indica;* but joints 3—4 of the antennæ are longer than broad in the soldier, as long as broad in the female.

♃. Length: 4—5 millims. A curved striation at the posterior angles of the head. Head shining between the striæ.

☿. Length: 2. 5—2. 8 millims.

♀. Length: 7—7.5 millims. Head narrower than the thorax.

20. PHEIDOLE LATINODA, Roger (Berl. ent. Zeitschr. 1863), ♃, ☿, and ♀, var. MAJOR.

The specimens are larger than Roger's and Mayr's. This species has hitherto only been found in India, and the ♀ is still unknown.

♃. Length: 5. 4—6. 2 millims. Head coarsely striate-rugose, posteriorly coarsely rugose-reticulated. The ground of the reticulations is moderately shining and sometimes contains secondary rugosities. Less shining than *P. indica;* the clypeus carinate (in *P. indica* not carinate);

the basal surface of the metanotum transversely rugose. The first node of the petiole anteriorly almost broader than posteriorly; beneath, furnished with a longitudinal carina. The second node very broad, nearly three times as broad as the first. Tibiæ and scapi of the antennæ abundantly furnished with long erect hairs.

☿. Length 3—3.3 millims. Antennæ and legs very long and slender, with abundant long erect hairs. First node of the petiole convex beneath. Spines of the metanotum longer and at the base narrower as in *P. indica.*

♀. Length: 7.5—8 millims. Head (without the mandibles) broader than long, broader than the thorax, little shining. Thorax narrow and short. Mesonotum longitudinally rugose (wrinkled). The wrinkles converge anteriorly and anastomose together at the median line in front. Mesonotum opaque, granulated between the wrinkles. Scutellum smooth and shining. Metanotum between the spines with some coarse longitudinal wrinkles laterally, smooth and shining in the middle.

Nodes of the petiole very broad. The first is short and bears upwards a much broadened transverse scale, which is emarginate at the middle of its superior margin. The first node with a longitudinal, lobiform, very prominent edge beneath. The second node twice as broad as the first, and nearly three times as broad as long, coarsely rugose with an obtuse tooth beneath. The anterior half of the basal segment of the abdomen closely striate-rugose, the posterior finely and closely reticulate-punctured, opaque. The anterior two-thirds of the following segments smooth and shining; their posterior third reticulate-punctured and opaque.

Wings pale yellowish.

In other respects like the soldier.

21. Pheidole jucunda, n. sp.

This species resembles *P. javana*, Mayr, and *P. indica*, Mayr. The soldier only is known.

♃. Length: 3.3 millims. Head (without the mandibles) rectangular, a little narrowed posteriorly, deeply emarginate and a little flattened behind (like the *P. latinoda*), relatively small. The anterior half of the clypeus carinate. The anterior edge of the clypeus emarginate in the middle. Mandibles shining, very delicately striate-rugose, with scattered punctures and with two blunt teeth at the apex. Scapus of the antennæ lodged in a distinct, smooth, longitudinal groove, which is edged medially by the very long frontal edges *(laminæ frontales).* Scapus of the antennæ very long; but not quite reaching the posterior angles of the head. Joints 3—6 of the funiculus of the antennæ as broad as long.

Mesonotum with a deep transverse impression, which is nearly as deep as the meso-metanotal groove. Basal surface of the metanotum narrow, with a very distinct, abruptly edged longitudinal channel in the middle. Spines of the metanotum of moderate size, divergent, near one another at the base. The nodes of the petiole have the usual form; the second node rounded, without lateral conuli. Antennæ and legs rather elongate.

Head coarsely and longitudinally striated in the middle; striate-rugose, then reticulate-rugose at the sides, very coarsely rugose-reticulate at the posterior angles (like *P. latinoda*). Frontal area and middle of the clypeus nearly smooth. Thorax wrinkled and rugose, moderately shining. The sides of the mesonotum and metanotum, as also the declivous (posterior) surface of the metanotum finely reticulate-punctured and opaque. Nodes of the petiole finely reticulate, nearly opaque. The base of the abdomen very delicately reticulate; the rest smooth and shining with some scattered punctures, with a hair in each point.

Head and abdomen sprinkled moderately with erect hairs. A few scattered erect hairs on the thorax and the femora. The tibiæ and scapi without erect hairs, only with a delicate quite applied pubescence. The body nearly without applied pubescence.

Dark ferruginous-red. The posterior three-fourths of the head, the scapi, and the abdomen (its base excepted) dark chestnut-brown.

This species is easily to be distinguished from the *Ph. latinoda* by its smaller size, its tibiæ and scapi without erect hairs, the nodes of its petiole, etc.; from the *Ph. indica* by its carinate clypeus, its more emarginate head with the posterior angles coarsely reticulate-rugose, etc. The closely allied *Ph. javana* has very abundant erect hairs on the legs and on the antennæ, the metanotal spines much removed from another at the base, the clypeus without carina, etc.

22. PHEIDOLE WOOD-MASONI, n. sp.

I dedicate this pretty little new species to Prof. J. Wood-Mason, who has been so kind as to send it to me with the others noticed in this paper.

♃. Length 2.6 millims. Head elongate, rectangular, slightly emarginate behind. Eyes very minute, each compounded of about 20 facets, situated at the arterior quarter of the head. Antennæ very short; scapi of the antennæ as long as half the breadth of the head, either as long as two-fifths of the length of the head (without mandibles). Antennæ 12-jointed, with very large club; the last joint as long as the two precedent together. Joints 2—6 of the funiculus twice as broad as long. Mandibles smooth, shining, with very scattered punctures and with two black teeth at the end of the terminal edge. Clypeus very short, very deeply and broadly emarginate at the middle of its anterior edge, as smooth in its middle part even as the frontal area, longitudinally striated at the sides. Antennal fossa very near to the anterior edge of the head. Frontal edges as long as the scapi. At their exterior side is a smooth and shining groove in which the scapus is lodged. The anterior half of the head is longitudinally striated; the posterior is smooth, shining, with some scattered puncture, with a hair in each point.

Thorax very short. The pronotum is broadened and forms at each side an edged and rounded protuberance. The pronotum and the mesonotum form together only one convex, smooth, and shining hump, without transverse impression. The meso-metanotal groove is very distinct. Metanotum low; its basal surface with two minute longitudinal edges at the sides, which terminate each in a triangular tooth (instead of the spines). The basal surface of the metanotum delicately transversely reticulate, the declivous one delicately transversely reticulate-rugose.

The nodes of the petiole have the usual form. They are narrow and microscopically reticulate. Abdomen smooth and shining with large golden concave points on its first segment. The whole body, inclusive of the tibiæ and of scapi, covered with erect hairs.

Yellow. The anterior edge of the clypeus and the anterior half of the mandibles darkened; the terminal edge of the mandibles blackish.

☿. Length: 1.5 millim. Stature relatively short and thickset. Head oval, not emarginate. Antennæ like those of the soldier. The scapi reach the posterior edge of the head. Mandibles smooth, shining, with scattered puncture and eight teeth. Clypeus entire, smooth and shining like the whole head. Eyes very minute, situated on the anterior third of the head, and each compounded of about 12 facets. No groove for the scapi. Thorax as in the soldier, but the metanotum is less low. Metanotum with two minute teeth, extremely finely and transversely wrinkled between these teeth. Nodes of the petiole microscopically reticulate. A very large brownish and gilt puncture on the abdomen. This puncture is more abundant than that of the soldier, and even more abundant than in *Tetramorium auropunctatum.* The erect hairs of the body are a little more scattered and those on the tibiæ and scapi more oblique than in the soldier.

Entirely yellow, with the terminal edge of the mandibles darkened and the puncture of the abdomen brownish (and gilt).

Genus PHEIDOLOGETON.

Mayr, Myrmecol. Studien, 1862.

23. PHEIDOLOGETON LABORIOSUS, Smith (Proc. L S. Zool. 1861, *Solenopsis*), ☿ major.

Genus SOLENOPSIS.

Westwood, Ann. & Mag. Nat Hist vi, 1841.

24. SOLENOPSIS GEMINATA, Fabricius (Syst. Piezat. 423, 1822, *Atta*), ☿ major and minor, ♀, and ♂.

One of the commonest cosmopolitan tropical ants.

Genus MONOMORIUM.

Mayr, Formic. Austr. 1855.

25. MONOMORIUM LATINODE, Mayr (Ann. Mus. Civ. Genova, 1872), ☿.

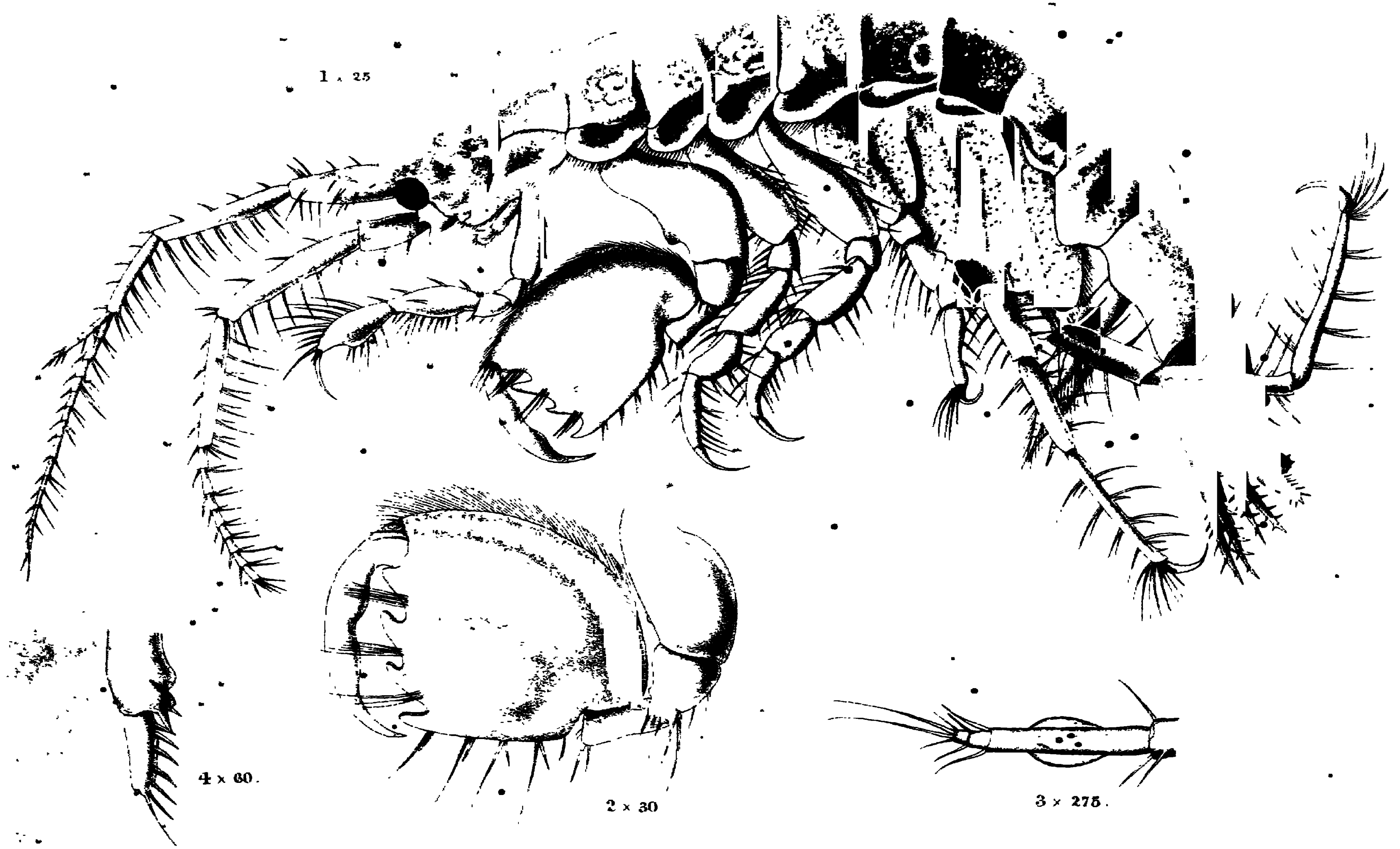
Genus MERANOPLUS.

Smith, Trans. Ent. Soc. Lond. 1853.

26. MERANOPLUS BICOLOR, Guérin (Icon. Règn. Animal 1829—38, *Cryptocerus*), ☿.

A further *Pheidole* ♂ is not to be determined without the correspondent soldier, worker, or female.

All the species included in the foregoing list were obtained in the neighbourhood of Calcutta.



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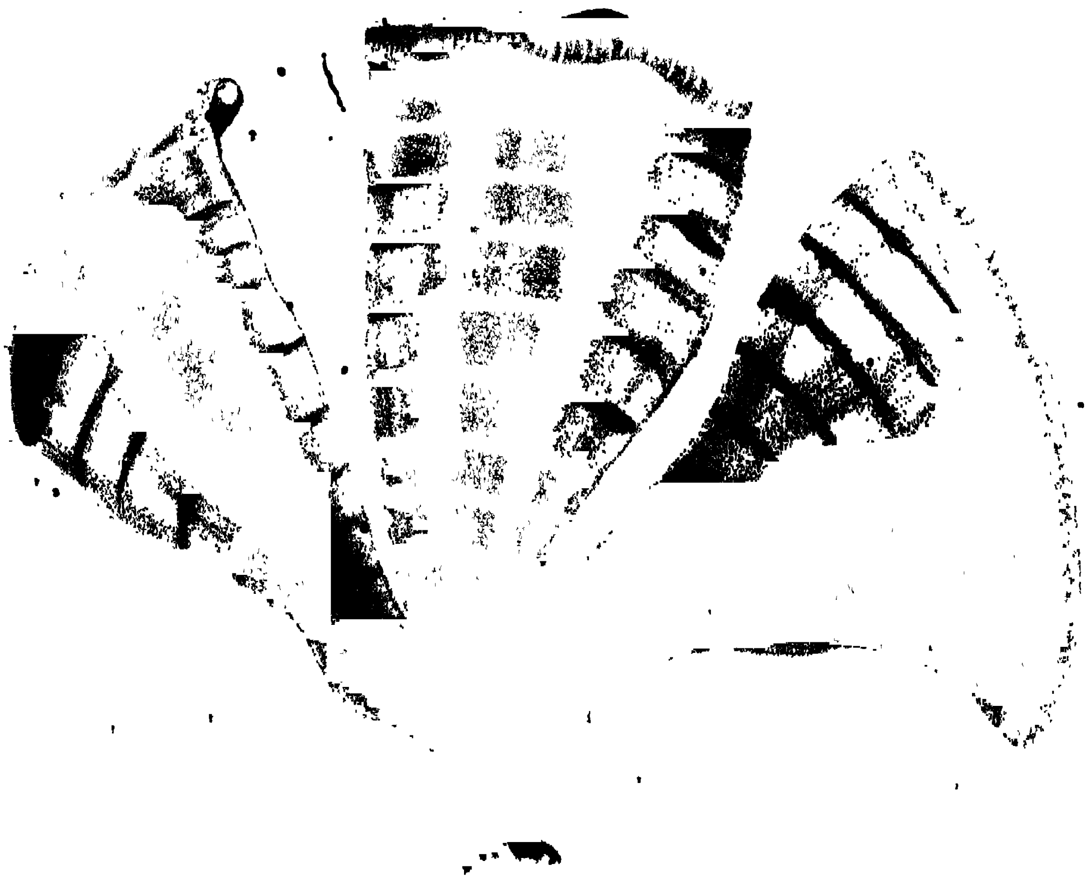

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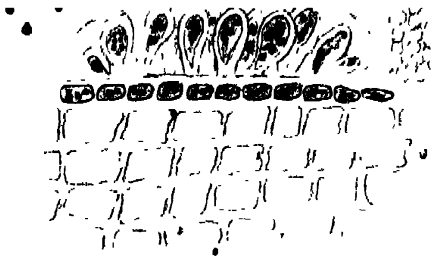

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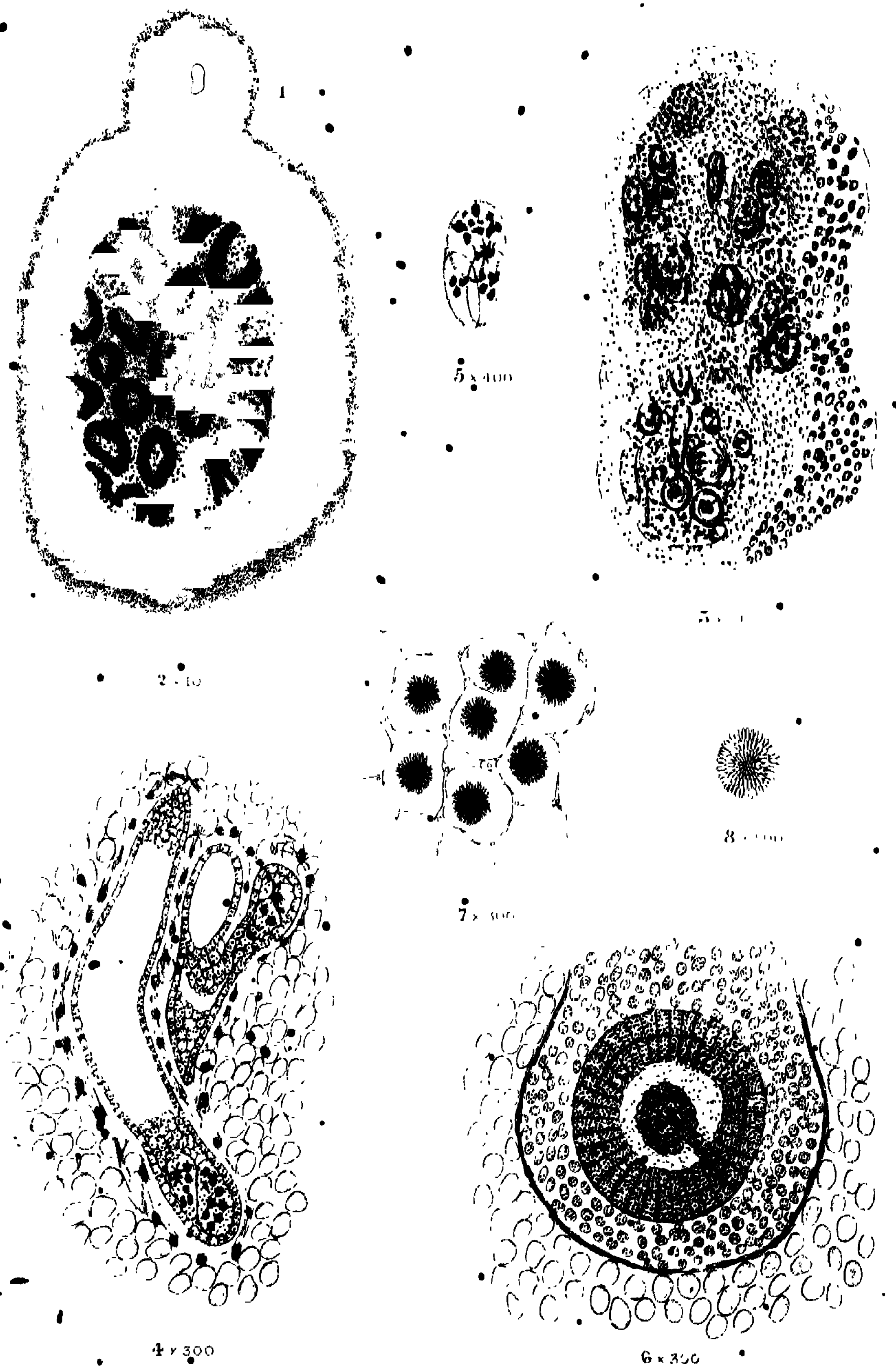
Padina pavonia

G. M. GILES, Journ. Asiat. Soc. Bengal, 1885, Vol. LIV, Pt. II.

Pl. V.



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Padina pavonia.